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EIGHTH ANNUAL GUIDE

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a month*

Intel® Celeron® processor 2.00GHz
15" XGA TFT Display
256MB DDR SDRAM
30GB SMART Ultra-ATA Hard Drive†
DVD/CD-RW Drive††
1.44MB Floppy Drive
ATI Radeon IGP 345M Integrated UMA 4X
AGP Graphics with 64MB DDR SDRAM Shared
Integrated Mini PCI 56K V.92 Modem††
Integrated 10/100 NIC
Microsoft® Windows® XP Professional
1-Year Worldwide Limited Warranty**



COMPAQ EVO N620c NOTEBOOK

\$1,799 Lease for \$75
a month*

Intel® Pentium® M processor 1.40GHz
14.1" XGA TFT Display
256MB DDR SDRAM
40GB SMART Ultra-ATA Hard Drive†
DVD Drive
ATI Mobility Radeon 7500 graphics controller
with 32MB DDR VRAM
Compaq Premier Sound™ Enhanced Stereo
Audio System
Integrated Mini PCI 56K V.92 Modem††
Integrated 10/100/1000 Gigabit NIC
Microsoft® Windows® XP Professional
3-Year Worldwide Limited Warranty**



HP COMPAQ nx7000 NOTEBOOK

Wide-screen to go.

\$1,699 Lease for \$71
a month*

Intel® Centrino™ mobile technology
(Intel® Pentium® M processor 1.40GHz,
Intel® PRO/Wireless Network Connection 802.11b,
Intel® 855 Chipset Family)
15.4" WXGA Display
40GB Hard Drive†
512MB SDRAM Memory
DVD Drive
56K Modem + 10/100 Ethernet
Microsoft® Windows® XP Professional
1-Year Limited Warranty**



HP COMPAQ nc4000 NOTEBOOK

Allows you to do more on the go.

\$1,799 Lease for \$73
a month*

Mobile Intel® Pentium® 4 Processor
1.40GHz - M
12.1" XGA Display
40GB Hard Drive†
256MB SDRAM Memory
56K Modem + 10/100 Ethernet
Microsoft® Windows® XP Professional
3-Year Limited Warranty**

CNET Editor's Top 5—Thin and Light Notebooks, N600 Series, *Computer Shopper*, July 2002

may be up to 1500 Mbps using 4X-12X high-speed media discs for best performance; for reading CD media, the max transfer rate may be up to 6000 Kbps. Actual transfer rates may vary depending on media quality. 10/100 V.92 Modems are designed only to allow faster downloads from K56flex or V.90 V.92 compliant digital sources. Maximum achievable download transmission rates are currently unknown, may not reach 56 Kbps and will vary with line conditions. **4800 x 1200 optimum dpi color printing on premium photo papers and 1200 x 1200 input dpi. †Hyper-Threading Technology requires a computer system with an Intel® Pentium® 4 processor supporting HT Technology and a Hyper-Threading Technology-enabled chipset, BIOS and operating system. Performance will vary depending on the specific hardware and software you use. See <http://www.intel.com/info/hyperthreading> for more information, including details on which processors support HT Technology. During the HP-Compaq product transitions, some HP-Compaq products and packaging may be labeled with the Compaq brand. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries. Intel, Intel Inside, the Intel Inside Logo, Intel Centrino, Intel Xeon, Pentium and Celeron are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Other products mentioned herein may be trademarks or registered trademarks of their respective companies. © 2003 Hewlett-Packard Development Company, L.P.

Enhance your system.



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Small and sleek design with dual expansion slots and soft-touch sides

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- Integrated Bluetooth™ Wireless
- Intel® XScale™ processor, 400MHz
- 64MB (56MB main memory)
- Microsoft® Pocket PC 2003 Premium

\$399

HP iPAQ™ h5500 POCKET PC

The ultimate secure, mobile and productive tool

- Integrated WiFi and Bluetooth™ Wireless
- Biometrics Fingerprint Reader Security
- Intel® XScale processor, 400MHz
- 3.8" Transflective TFT Display with 64K Colors
- Microsoft® Pocket PC 2003 Premium
- 128MB SDRAM/48MB ROM
- Secure Digital Memory Slot (SDIO support)

\$649



HP psc 2110 ALL-IN-ONE

Color printing, color scanning, color copying

- Up to 4800-optimized dpi***
- HP PhotoREt III
- Up to 14 ppm text

\$149



HP LASERJET 1300

High-performance personal printer

- True 1200 dpi
- 20 ppm rich black text

\$399



HP tc2120 SERVER

\$729 Lease for \$31 a month*

- Single processor
- Intel® Pentium® 4 processor 2.66GHz
- 256MB ECC DDR SDRAM Memory, upgradable to 4GB memory
- 40GB ATA Hard Drive expandable to 240GB storage†
- 1-Year Limited Warranty**

HP PROLIANT ML330 G3 SERVER

\$1,129 Lease for \$47 a month*

- Dual processor capable
- Intel® Xeon™ processor 2.40GHz
- 256MB ECC DDR SDRAM Memory, upgradable to 4GB
- 36.4GB U320 Universal SCSI Hard Drive, expandable to 402GB storage†
- Four PCI slots (three available in SCSI models)
- Embedded NC7760 PCI Gigabit NIC
- 1-Year Global Pre-Failure Warranty**

HP PROLIANT ML350 G3 SERVER

\$2,098 Lease for \$88 a month*

- Dual processor capable
- Intel® Xeon™ processor 2.80GHz
- 256MB ECC DDR memory, upgradable to 8GB
- 36.4GB U320 Universal Hard Drive, expandable to 1.174TB storage†
- Embedded NC7760 PCI Gigabit NIC
- Optional Hot Plug/Redundant power supplies
- 3-Year Global Pre-Failure Warranty**



monitor not included

HP WORKSTATION xw4100

\$999 Lease for \$42 a month*

- Intel® Pentium® 4 processor 2.40GHz (800MHz FSB)
- 40GB Ultra ATA 100 (7200 rpm) Hard Drive†
- 512MB PC3200 DDR SDRAM
- NVIDIA Quadro NVS 200 AGP
- 48X CD-RW Drive††
- Broadcom Gigabit 10/100/1000 NIC
- Microsoft® Windows® XP Professional
- 3-Year Worldwide Limited Warranty**



monitor not included

HP WORKSTATION xw6000

\$1,449 Lease for \$61 a month*

- Intel® Xeon™ processor 2.40GHz
- 36GB U320 SCSI Hard Drive (10,000 rpm)†
- 512MB DDR SDRAM
- NVIDIA Quadro NVS 200 AGP
- Integrated Dual Channel Ultra320 SCSI and Ultra ATA/100
- 48X IDE CD-ROM Drive†
- Integrated AC97 Audio
- Integrated Gigabit (10/100/1000) Ethernet Controller
- Microsoft® Windows® XP Professional
- 3-Year Worldwide Limited Warranty**
- Get even more:
- L1825 18" TFT Monitor: Add \$599

0% for 24 months.

For a limited time, get 0% lease rate on qualifying total purchases greater than \$499 made before August 31, 2003.

Prices shown are HP direct prices. Reseller and retail prices may vary. Prices shown are subject to change and do not include applicable state and local sales tax or shipping to recipient's destination. Photography may not accurately represent exact configurations. Prices, financial lease rates, assuming lease does not exercise a fair market value purchase option at the end of the lease term and timely return the leased equipment to Hewlett-Packard Financial Services Company (HPFS), at the end of the lease term and disposition of any charges payable by lessee other than rental payments such as taxes, fees and shipping charges. Offer valid through 8/31/03 on all lease transactions with a total transaction amount between \$499 and \$100,000. Lease products available through HPFS to qualified commercial customers in the U.S. and subject to credit approval and execution of Standard HPFS lease documentation. Other restrictions may apply. HPFS reserves the right to change or cancel this program at any time without notice. For hard drives, 68-billion bytes. 48X Max CD-ROM Drive data transfer rates may vary from 6750 Kbps to 7900 Kbps. *Certain warranty restrictions and exclusions may apply. For complete warranty details, call 1-800-245-1535 (U.S.). **10Yr 48X CD-RW drive data transfer rates may vary as follows: for recording to CD-R media, the max transfer rate may be up to 4800 Kbps; for 48X CD-RW media, the max transfer rate may be up to 4800 Kbps.



small and
medium business



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you get to manage your business.

Get the d530 Small Form Factor and its system software manager, and you'll get a PC that saves you time and money. The d530 is loaded with software to help you centrally deploy business applications. Plus it's powered by the Intel® Pentium® 4 processor and comes with Microsoft® Windows® XP Professional, the most dependable Windows® architecture. When you get the d530, you'll get more than a PC. You'll get more reliability, more service and support, and more convenience through our local partners. To equip your business with the d530 today, contact HP or a member of HP's SMB partner network.



monitor not included

HP COMPAQ d530 SMALL FORM FACTOR

\$799 Lease for \$34 a month*

Intel® Pentium® 4 processor 2.40GHz
256MB DDR SDRAM Memory
40GB Hard Drive†
Integrated Intel® Extreme Graphics 2
48X/24X/48X CD-RW Drive††
Integrated Gigabit Ethernet
Microsoft® Windows® XP Professional
3-3-3 (Parts/Labor/On-site) Limited Warranty**



monitor not included

HP COMPAQ d220 MICROTOWER

\$499 Lease for \$21 a month*

Intel® Celeron® processor 2.00GHz
128MB DDR SDRAM Memory
40GB Hard Drive (5400 rpm)†
48X CD-ROM Drive†
Integrated 10/100 Ethernet
PS/2 Scroll Mouse
Microsoft® Windows® XP Professional
1-1-1 (Parts/Labor/On-site) Limited Warranty**



monitor not included

HP COMPAQ d530 SMALL FORM FACTOR

\$699 Lease for \$30 a month*

Intel® Pentium® 4 processor 2.40GHz
128MB DDR SDRAM Memory
40GB Hard Drive†
Integrated Intel® Extreme Graphics 2
48X CD-ROM Drive†
Integrated Gigabit Ethernet
Microsoft® Windows® XP Professional
3-3-3 (Parts/Labor/On-site) Limited Warranty**

Best of CES 2003 Innovation Award, D500 Series

HP COMPAQ d530 CONVERTIBLE MINITOWER

\$899 Lease for \$38 a month*

Intel® Pentium® 4 Processor 2.60GHz with HT Technology†††
512MB DDR SDRAM Memory
80GB Hard Drive†
Integrated Intel® Extreme Graphics 2
48X/24X/48X CD-RW Drive††
Integrated Gigabit Ethernet
Microsoft® Windows® XP Professional
3-3-3 (Parts/Labor/On-site) Limited Warranty**

HP COMPAQ d330 SLIM TOWER

\$779 Lease for \$33 a month*

Intel® Pentium® 4 processor 2.66GHz
256MB DDR SDRAM Memory
40GB Hard Drive (7200 rpm)†
48X CD-ROM Drive†
Integrated Gigabit Ethernet
USB Optical Scroll Mouse
Microsoft® Windows® XP Professional
3-1-1 (Parts/Labor/On-site) Limited Warranty**



HP recommends Microsoft® Windows® XP Professional for Business.

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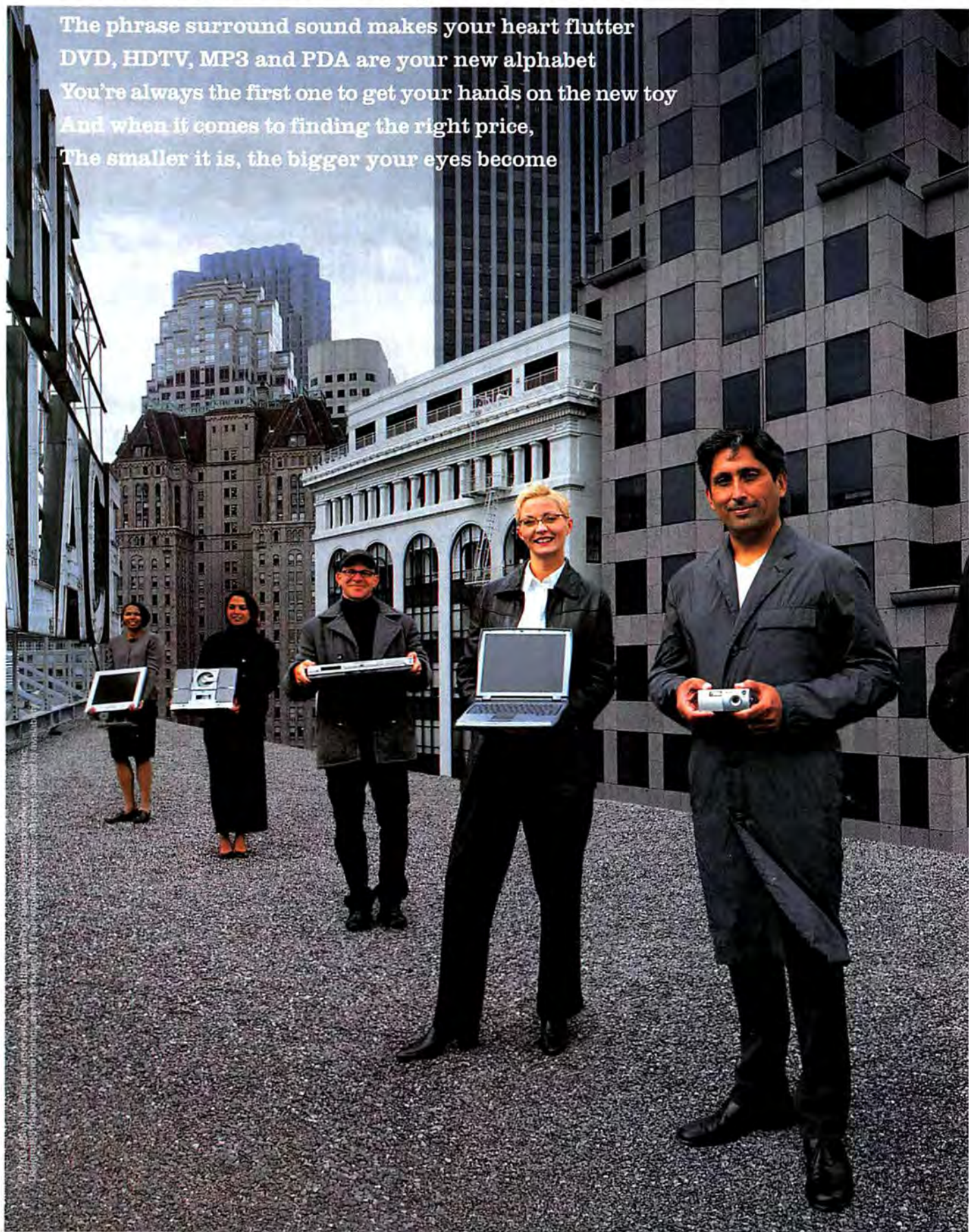
The phrase surround sound makes your heart flutter

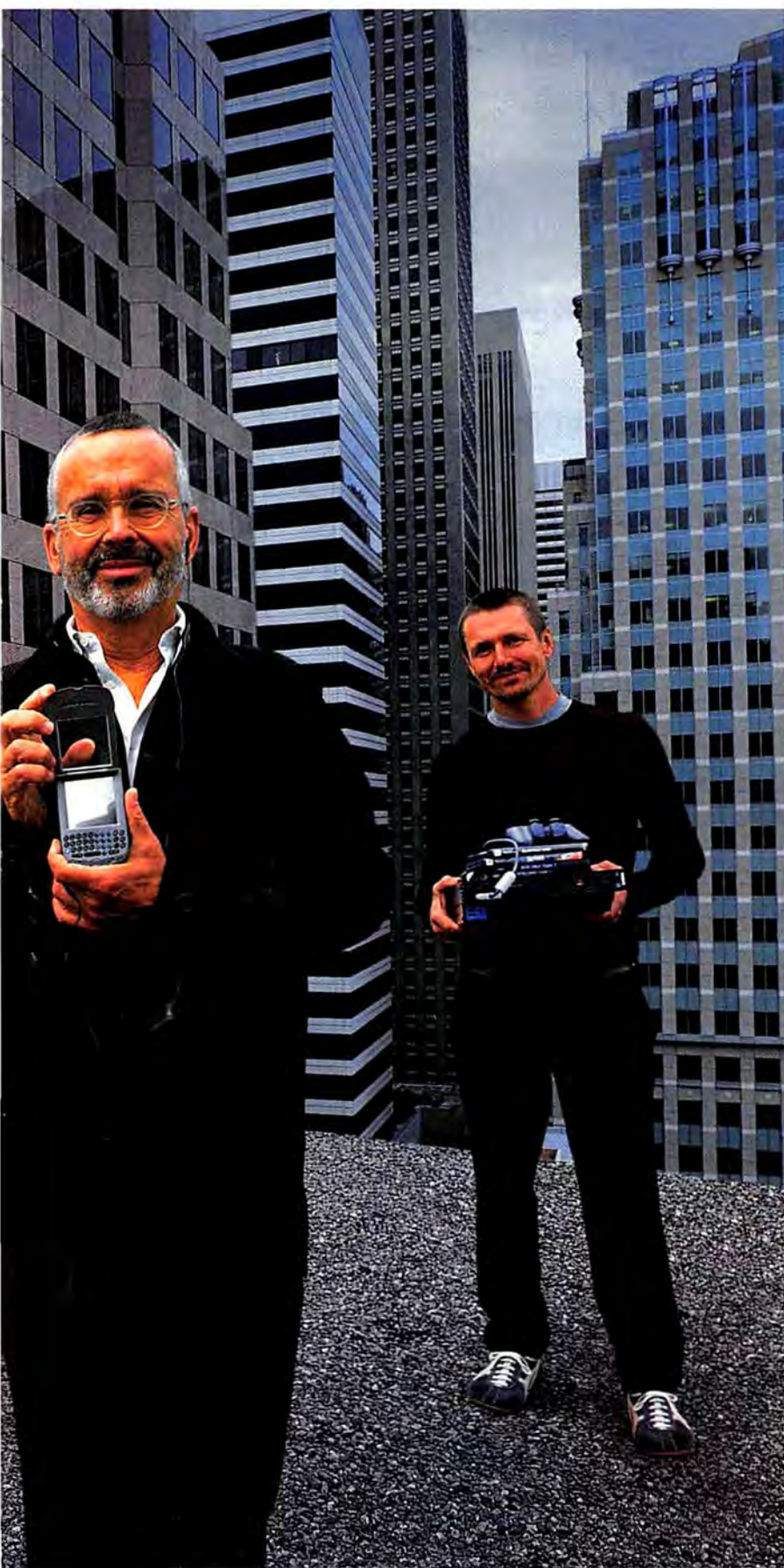
DVD, HDTV, MP3 and PDA are your new alphabet

You're always the first one to get your hands on the new toy


And when it comes to finding the right price,

The smaller it is, the bigger your eyes become






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Buy It Now Don't want to bid on an item? If the thing you want has the "Buy it Now" icon next to it, you can buy it right away without waiting.

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Instant review

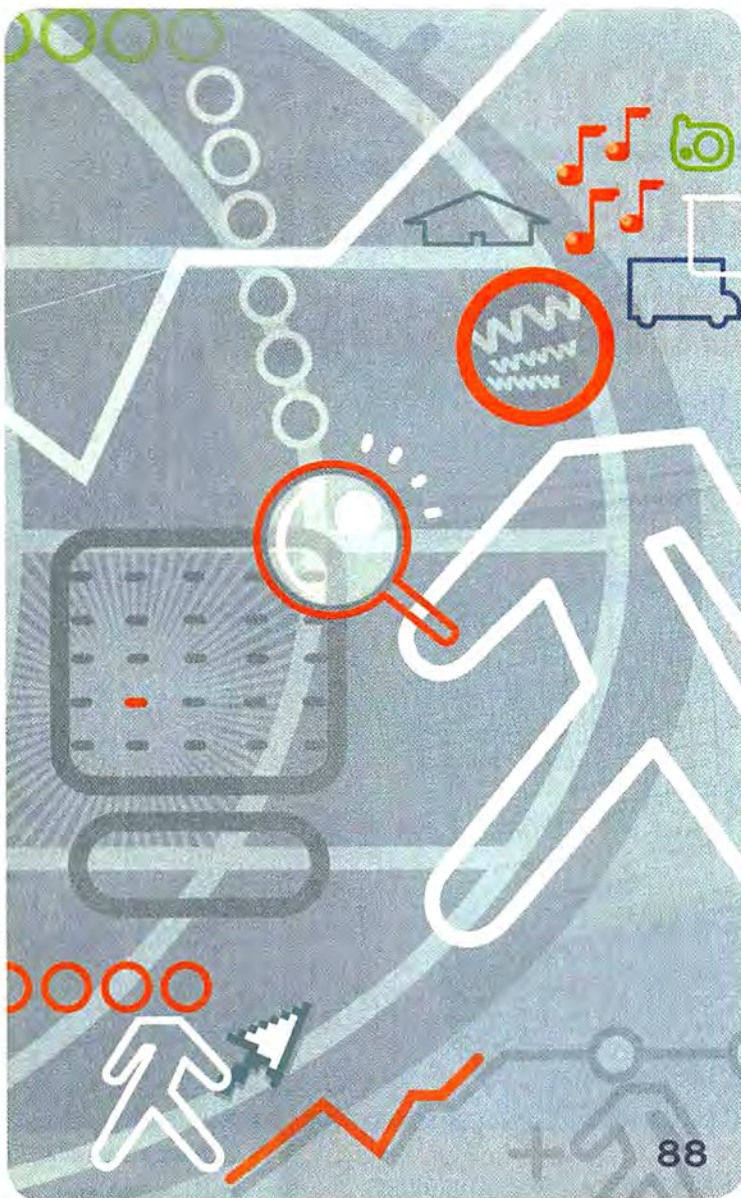


BenQ FP591 or FP791 monitors include a Digital Photo Frame (DPF) allowing you to view digital photos instantly without a PC. You also get A+ panel quality images that rate near the top of the industry's stringent ranking standards.

Not to mention a 16ms signal response time for flicker-free images, an ultra-high brightness/contrast ratio and SRS technology for stereo surround sound. Memories of a lifetime can now be viewed in an instant, thanks to BenQ. Visit www.BenQ.com/2003/PCWorld-FP591 for more details.

**A+ PANEL
QUALITY**

BenQ
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COVER STORY

88 Best Free Stuff on the Web

The Internet continues to offer a broad assortment of useful, informative, and fun things that cost absolutely nothing. We went online and tracked down the best free tools, services, tech help, and entertainment that the Net has to offer. Plus, check out our collection of great ways to put yourself on the Web, enhance your browser, and more.

Cover illustration by Celia Johnson.



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PC WORLD

20TH ANNIVERSARY YEAR
AUGUST 2003
VOLUME 21 ♦ NUMBER 8
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WWW.PCWORLD.COM

FEATURES

PORTABLE STORAGE

104 Mega Storage to Go

Whether you have just a few files to move or a whole hard disk's worth of data to back up, there's a portable drive just right for you. Discover which models provide the best blend of capacity, convenience, and cost.

WINDOWS SECRETS

113 Pain-Free Windows Tweaks

The place to quash Windows annoyances or automate more desktop tasks is the Registry. Our tips will help you venture into the cerebrum of Windows and emerge with a better PC. It ain't brain surgery.



THE SPAM WARS

123 Uncle Sam vs. Spam

In Congress, half a dozen bills are vying to put the brakes on spam. But in their haste to legislate, lawmakers may be ignoring the best model for an effective antispam statute.

ON THE COVER



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Simulation

REMOTE ACCESS from Verizon Wireless Office keeps your employees productive when they're on the road. Because with our wireless PC card in their laptop, your data travels on America's most reliable wireless network. This means they can enjoy easy, convenient access to the Internet, corporate intranet, e-mails, databases, files and applications. So they can take care of business anytime—without having to seek out a landline wire, jack or ISP again.

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Makes laptop connections wireless

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Check e-mail or access corporate intranet



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Block Spam

These essential utilities will help you keep junk e-mail at bay.

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REVIEWS

Top 10 Graphics Boards

NVIDIA's GeForce FX 5800 Ultra chip appears in two new boards.

find.pcworld.com/36302

COMING UP IN SEPTEMBER

Perfect Your PC: Discover quick and easy upgrades that boost performance, add storage, improve audio and graphics—and avoid common upgrade gotchas.

Do-Everything Handhelds: We

see if super-PDAs can really replace a host of different gadgets.

Online Music and Movies: Internet services offering entertainment for a fee keep getting better. Which ones deserve stardom?

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Low-quality counterfeit inks masquerading in legit-looking packages can wreck your printer.
- 30 **Buying DVD Burners Gets Easier**
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- 32 **Copy Controls Crackdown**
The entertainment industry's pressure on ISPs and individual consumers continues to rise.
- 34 **Better 802.11 Security**
The new WPA security algorithm offers much better protection than the old WEP standard.
- 36 **FireWire 800: Fast Not Furious**
The third-generation FireWire outpaces its predecessors but may require a RAID setup to shine.
- 36 **Pocket PC Update: So-So**
HP's IPAq 2210 PDA comes with Pocket PC 2003.

NEW PRODUCTS

- 72 **Tablet PCs**
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Install and adjust a software-based personal firewall to safeguard your PC or network.
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Get the most from AOL and MSN; reduce the flow of spam; download a free software firewall.
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Uninstall unwanted Windows Updates; give folders the appearance you prefer; change your default e-mail client; format Word paragraphs.



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\$139.70
CDW 386272



Acer TravelMate C110 Convertible Tablet PC

- > 900MHz Ultra Low Volt Intel® Pentium® M processor
- > Memory: 512MB
- > 30GB hard drive
- > Includes Intel 802.11b wireless
- > 10.4" active-matrix display supporting pen-based input



\$1999.95
CDW 489679



APC Smart-UPS RM 1U

- > 1,000VA, 640W rackmount battery backup, 4-outlet
- > AVR Boost and AVR Trim automatically corrects brownout and overvoltage conditions
- > Innovative line-interactive design uses the DC to AC power inverter "in reverse"
- > Network grade surge suppression and lightning protection
- > Automatic battery and UPS self testing



\$546.88
CDW 434905



Avocent 4 Port SwitchView KVM Switch

- > Compact design - easy to install
- > Controls desktop and notebook PCs with one set of peripherals
- > Extensive mouse support
- > Onscreen management with the OSD model
- > Zero footprint on the desktop with the DT model
- > Multiplatform support with the MP model



\$92.36
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Hard drives sold separately

HP ProLiant DL380 G3 server

- > 2.4GHz Intel® Xeon processor
- > Memory: 512MB RAM std., 6GB max.
- > 880.8GB max. internal storage
- > 24X Max CD-ROM drive
- > 2 x 10/100 Ethernet



\$3399.99
CDW 433363

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> 10:45 pm. Account Manager Erin Bliss finishes Advanced Linux Volume IX. Meanwhile, husband Gary begins XP For Dummies.

A man and a woman are lying in bed, reading books. The woman on the left is reading "Advanced Linux Networking". The man on the right is reading "Windows XP For Dummies". Between them is a large stack of technology manuals, including titles like "Modular Access Router Manuals", "Building a Storage Area Network", "Cisco Systems", "Veritas", and "CDW". A small cat is lying on the bed in front of them. The background is a blue wall.

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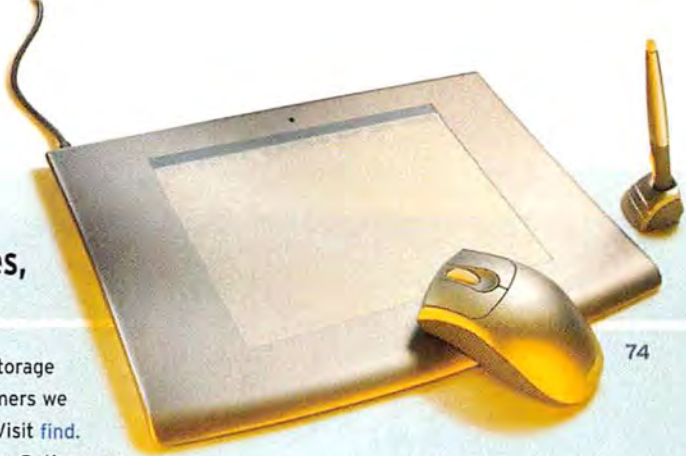
They undergo continuous training and provide expert advice on over 1,200 leading technology brands. That's your dedicated account manager. Someone who knows technology and you.

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This Month We Look at Input Devices, Portable Storage Options, and More

INNOVATIVE INPUT devices and a multitude of portable storage options debut in this issue. A complete list of the newcomers we cover follows, along with each item's star rating, if any. Visit find.pcworld.com/10860 for more information on PC World's Star Ratings.



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DESKTOP PCs

- 136 ABS Bravado 2280 ★★☆☆☆
- 136 HP Pavilion 764N ★★☆☆☆
- 136 IBuyPower Night Dreamer XP ★★☆☆☆
- 136 @Xi Computer MTower 3000+ ★★☆☆☆

NOTEBOOK PCs

- 140 Dell Inspiron 500m ★★☆☆☆
- 140 Dell Inspiron 5100 ★★☆☆☆
- 78 Dell Latitude D400 ★★☆☆☆
- 140 Dell Latitude D600 ★★☆☆☆
- 140 Toshiba Tecra S1 ★★☆☆☆

TABLET PCs

- 72 Acer TravelMate C110 ★★☆☆☆
- 72 Motion Computing M1300 ★★☆☆☆

COLOR LASER PRINTERS

- 76 HP Color LaserJet 1500L ★★☆☆☆
- 143 Lexmark C912dn ★★☆☆☆
- 143 Panasonic KX-CL500 ★★☆☆☆
- 143 Xerox Phaser 7300/DN ★★☆☆☆

19-INCH LCD MONITORS

- 145 Cornea Systems CT1904 ★★☆☆☆
- 145 Dell UltraSharp 1901FP ★★☆☆☆
- 145 Eizo Nanao FlexScan L767 ★★☆☆☆
- 145 NEC-Mitsubishi AccuSync LCD9V ★★☆☆☆
- 145 Sharp LL-T19D1 ★★☆☆☆
- 145 ViewSonic VP191b ★★☆☆☆

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- 147 Hitachi Deskstar 180GXP IC35L120AVV207-1 ★★☆☆☆
- 147 Maxtor DiamondMax Plus 9 6Y080LO ★★☆☆☆
- 147 Maxtor DiamondMax Plus 9 6Y160MO ★★☆☆☆
- 147 Samsung SpinPoint SP8004H ★★☆☆☆
- 147 Seagate Barracuda 7200.7 ST3160021A ★★☆☆☆
- 147 Seagate Barracuda 7200.7 ST3160023AS ★★☆☆☆

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- 111 LaCie D2 U&I Hard Drive ★★☆☆☆
- 111 Maxtor Personal Storage 5000DV ★★☆☆☆
- 111 SmartDisk FireLite Portable FireWire Hard Drive ★★☆☆☆
- 111 Storix Fusion 40GB HDD ★★☆☆☆
- 111 WiebeTech UltraGB-120HS ★★☆☆☆

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- 107 Lexar Media JumpDrive Trio ★★☆☆☆
- 107 M-Systems DiskOnKey Classic 2.0 ★★☆☆☆
- 107 SanDisk Cruzer ★★☆☆☆
- 107 TrekStor USA ThumbDrive 2 Smart ★★☆☆☆

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- 109 Plextor PlexWriter Premium ★★☆☆☆

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- 149 Kodak EasyShare DX6340 ★★☆☆☆
- 149 Nikon Coolpix 3100 ★★☆☆☆
- 149 Olympus C-740 Ultra Zoom ★★☆☆☆
- 149 Sony Cyber-shot DSC-P72 ★★☆☆☆

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- 82 Interlink Electronics VersaPoint Communicator ★★☆☆☆
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DIGITAL PAINTING SOFTWARE

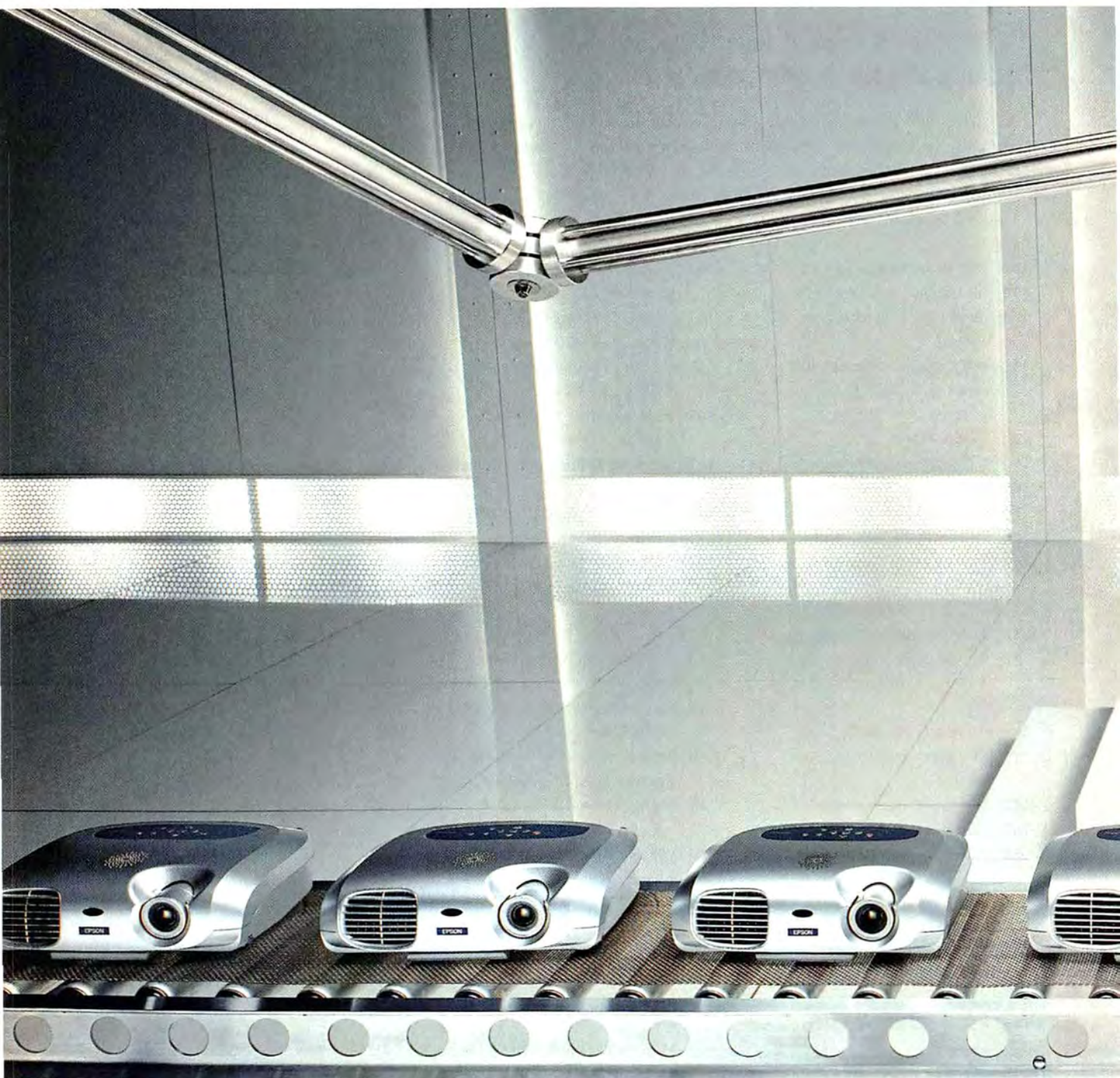
- 74 Corel Painter 8 ★★☆☆☆

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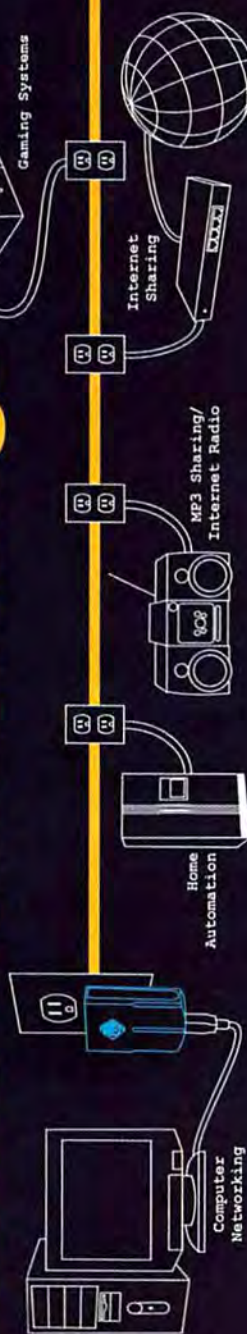


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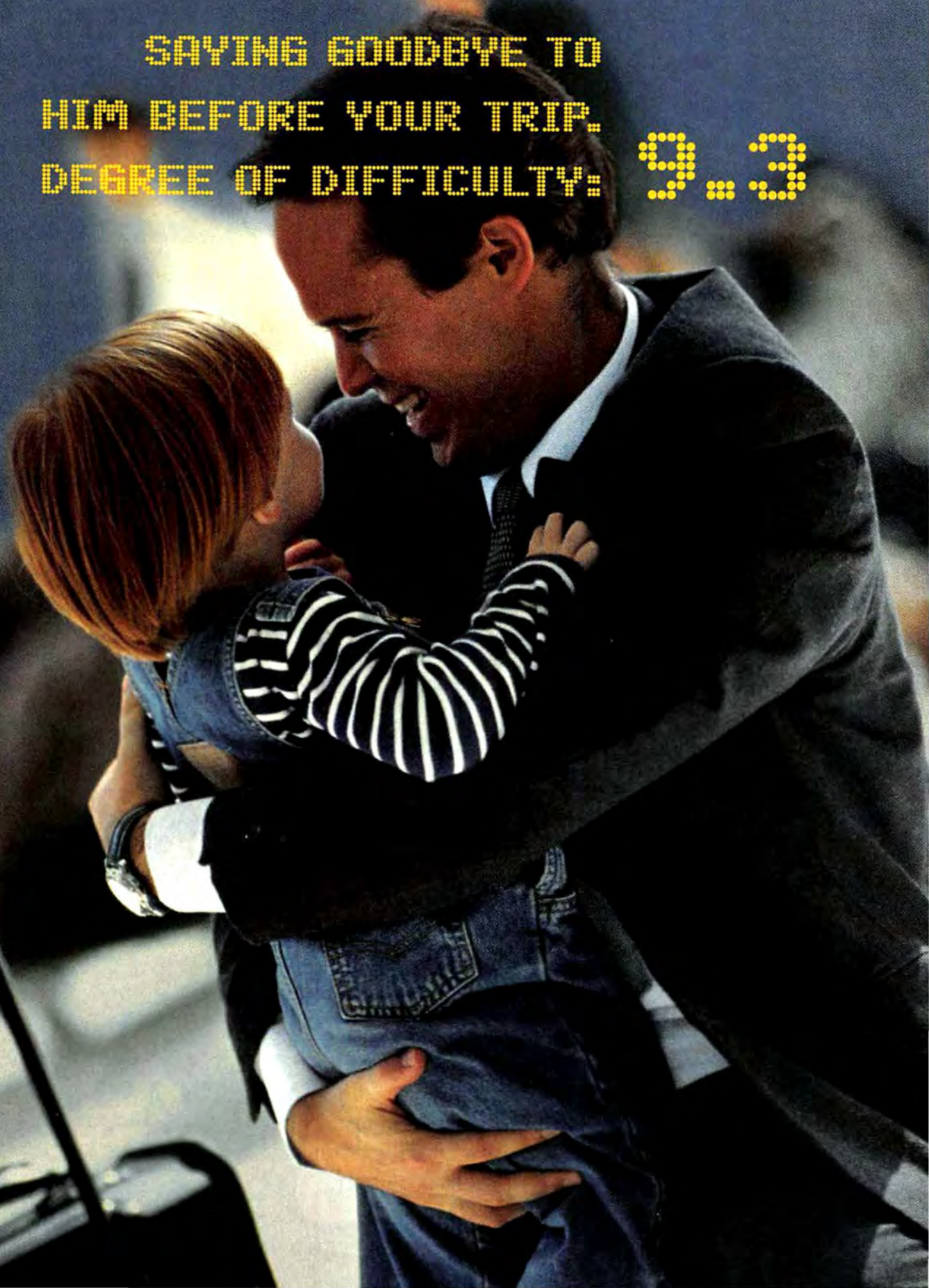
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Spam and Punishment

Technology alone isn't canning spam—it's time to bring in the feds.

SPAMASSASSIN. SPAMKILLER. SPAM PUNISHER. And, of course, Spam Must Die! Judging from the names of these and other antispam utilities, a veritable army of technology companies is attempting to blast junk e-mail off the face of the earth. But every person with an e-mail address

knows the ugly truth: Spam is alive, kicking, and trashing our in-boxes.

And to swipe a phrase from Nietzsche, what doesn't kill spam makes it stronger.

ISPs continue to fortify their servers against sleazy marketers who try to hijack them to send spam, and filtering software is improving at spotting unwanted inbound messages. Yet these defenses trigger new generations of smarter, sneakier spam. Clearly, technology alone isn't going to quash the junk anytime soon.

ENTER UNCLE SAM

CAN GOVERNMENT succeed where science, so far, has failed? That's the hope behind an array of proposed new laws designed to put spammers out of business. In "Uncle Sam vs. Spam" (page 123), *PC World* Contributing Editor and veteran spamologist Daniel Tynan provides a field guide to these federal and state proposals. (One spam bill is definitely *not* like another: They differ even on their definition of what constitutes junk e-mail.)

The right law would provide both a deterrent effect and the ability to punish those people who do spam. But there are plenty of reasons to approach legal solutions with healthy skepticism. The most damnable spammers, such as grifters and porn peddlers, are the least likely to be fazed by laws. Many are located offshore, out of easy reach of U.S. authorities.

Though I despise spam greatly, I love the First Amendment more—so I fret about proposed laws that would dictate



what you can and can't say in an e-mail message. Should they draw distinctions between bulk mailers who hawk "herbal Viagra" and more-responsible senders? If I drop a note to a friend of a friend telling him I'm trying to sell my car, have I become a spammer? Most important, can we be sure such laws will never be used against political or religious speech?

There are no easy answers here, one reason why none of the national laws currently under consideration is a slam-dunk. But as Tynan reveals, antispam leg-

islation isn't only about solving today's spam plague—it's about preventing the far worse one that could be on its way.

The numbers tell the story: In 2001 spam made up a merely irritating 8 percent of all e-mail, according to estimates by Brightmail, a spam-filtering company. That figure ballooned to an alarming 40 percent in 2002, Brightmail says. So when research firm The Radicati Group says that spam could make up 70 percent of all e-mail by 2007, it's not just a nightmare scenario—it's utterly plausible.

Despite my reservations, I believe we need both a national law and better software to kill spam before it kills off e-mail as a useful communications tool. Read Tynan's article for the scoop on upcoming fixes (both legal and technical) and for details on why even the most spamophobic among us shouldn't leap to support the first bill that comes along.


STAY TUNED

A FINAL NOTE: "Uncle Sam vs. Spam" kicks off *Spam Watch*, ongoing coverage of e-mail abuse and the war against it. Look for more *Spam Watch* articles in coming months, including news updates, software reviews, and self-defense tips.

We'll cover this beat until there isn't a problem to write about—and may that day come sooner than we expect. ■

Contact *PC World* Editor Harry McCracken at mageditor@pcworld.com.

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BOGUS INK STINK

COUNTERFEIT INK AND TONER CARTRIDGES CAN RUIN PRINTS, SPRAY INK, AND PERMANENTLY DAMAGE YOUR PRINTER. PART ONE OF A SERIES ON CHEAP INK. **BY TOM SPRING**

IN EARLY FEBRUARY, Yasar Sattar shook hands with undercover detective Rod Jones and a private investigator for Epson, who were posing as potential ink buyers. All three men were inside a Brampton, Ontario, doughnut shop, and Sattar had just agreed to sell \$30,000 (U.S.) worth of Epson and Hewlett-Packard ink jet and toner cartridges for a fraction of the normal price.

Jones and the Epson sleuth, who had pegged the cartridges as counterfeit after a lengthy joint investigation, hopped into an SUV and followed Sattar to a nondescript warehouse a mile away. There, Sattar swung open a metal door to reveal pallets of what looked like legitimate ink cartridges, packaged for sale.

"These fakes looked so real, I couldn't believe my eyes," recalls Jones, a member of the Brampton-based Peel Regional

Police's intelligence unit. Sattar handed Jones the invoice for the cartridges, assuring him that the ink was genuine. Backup officers then barged in and arrested Sattar, ending one of a growing number of worldwide sting operations against counterfeit-ink rings.

GROWING PROBLEM

IN U.S. AND Canadian stores and on a host of Web sites, counterfeit ink jet and laser toner cartridges packaged as the real thing are becoming as ubiquitous as bogus Rolex wristwatches and fake Prada handbags. Individuals and businesses that purchase these knockoffs to save a few bucks can wind up with substandard prints, leaky or exploding cartridges, and permanent damage to their printers.

The problem has reached epidemic proportions in some areas—as much as half of cer-



CANADIAN POLICE DETECTIVE Rod Jones in a Brampton, Ontario, warehouse filled with dozens of boxes of confiscated counterfeit ink.

PHOTOGRAPH: EDWARD GAJDEL



FIND THE FAKE: Epson identified the cartridge package on the left as counterfeit; the one on the right was purchased from an authorized Epson reseller. Inset: Counterfeits can get messy.



tain brand-name inks sold in Mexico and in the Middle East may be inauthentic—and it's on the rise here as well. The Imaging Supplies Coalition, a printer and supplies manufacturers' organization, estimates that 1 of every 20 brand-name ink cartridges sold in the United States is counterfeit. Fake cartridges—which are not to be confused with third-party products clearly labeled as such and compatible with various name-brand printers—are showing up in reputable brick-and-mortar retailers and online stores. In at least some instances, the sellers do not realize the cartridges they're stocking are bogus.

The coalition estimates that its eight member companies—Brother, Canon, Epson, Katun (a maker of printer supplies), Lexmark, Oki, Toshiba, and Xerox—lost close to \$2 billion last year globally to fake ink and toner cartridges. It's easy to see why: Counterfeit ink is simple to manufacture, yields enormous profits, and is a consumable that people buy over and over again. According to police and private investigators, these characteristics

make ersatz ink an ideal product for both organized criminals and terrorist groups.

INTO THE INK WELL

TO SEE FOR ourselves how prevalent counterfeit ink has become, *PC World* purchased Canon, Epson, and Lexmark ink jet cartridges over the Internet and in several major U.S. cities, and then asked the vendors to determine their authenticity. Our experiment confirmed industry statistics: Three of the 65 ink cartridges we bought were counterfeit.

One of the fake cartridges was among 20 that we ordered from various vendors online; the other two were among 45 bought at retail stores. (Four other cartridges that we purchased online, although genuine, had problems: One had expired, another was only half full and didn't come in a box, and the remaining two were intended for sale in Asia.)

We also spoke with several people who, according to police records, had unknowingly purchased counterfeit ink from Sattar's company, Multi-Tech (no relation to the tele-

phony equipment manufacturer Multi-Tech Systems). Nearly all said they initially thought they were getting a great deal. But most complained of illegible printouts, clogged ink jet printers that took hours to clean, cartridges that didn't work, or broken printers that the customers had to scrap. Considerably fewer buyers of counterfeit ink had no problems.

"This stuff was nasty," reports

Terry Schumacher, a machine shop engineer residing in Mesa, Arizona. He bought eight cartridges for his Epson Stylus Photo 1280 printer for \$150—about half what they'd normally cost—through EBay. But he wound up discarding the cartridges when one of them "spit ink everywhere" after he installed it and tried to make prints. "This cartridge was a flawless copy of the real thing. The only problem is, the cartridge worked like crap," Schumacher says.

Gigi DiGiacomo, an agricultural economist from Minnetonka, Minnesota, says that counterfeit ink ruined the printheads of her Epson Stylus Photo 825 printer. "We... spent 4 hours trying to fix that printer," she says. Eventually, she and her husband got a new printer from Epson. DiGiacomo paid \$133—about 33 percent below the normal price—for the ten cartridges that she purchased online. "They were sealed and had holograms," she says. "I never thought for a minute they were fake."

Similarly, some owners ►

IN BRIEF

Product Pipeline

PALM ON WRIST: Fossil's Wrist PDA with Palm OS has more than time on its hands: It also has a backlit 160-by-160-pixel touch screen with a stylus and the hardware to power it. The watch comes with 2MB of internal memory, an infrared port to support beaming, a rechargeable battery, and a clutch of Palm applications. Prices range from \$275 to \$295, depending on the wristband. find.pcworld.com/36311



A less pricey data watch (without the Palm operating system) is Timex's \$90 Ironman Data Link USB model. find.pcworld.com/36119

Did You Know?

BABY BOOMERS are hesitant to bank online, a survey conducted by Knowledge Networks suggests. The research company surveyed a group of more than 1200 people between the ages of 39 and 57. Its results show that while almost half of them have made a purchase online, just 22 percent maintain an online bank account. And only 6 percent of the survey's respondents have used an online broker, the study shows.

22
PERCENT

of Brother multifunction printers never suspected that cartridges bought from a regional office-supply chain were bogus. When their machines began to fail, many owners blamed the hardware and sent the devices back to Brother.

"We figured out [that] the problem wasn't with the machine, it was the counterfeit ink cartridges," says Brother's marketing director Matt Hahn. Brother yanked the cartridges from the shelves, but the company won't say where the incident occurred or how many customers were affected.

PC WORLD'S BUYS

WHILE police say Sattar eventually confessed to knowingly selling fake cartridges directly to consumers, most retailers

that stock counterfeits do so unwittingly, says Tim Trainer, president of the International Anticounterfeiting Coalition.

For example, one of the fake cartridges that *PC World* purchased was sold by OmniPro

co-owner Ray Ricardo. "If we can't tell it's counterfeit, that makes it extremely hard to protect our customers," Ricardo isn't sure which of his distributors sold him the phony cartridge *PC World* purchased.

sources of—or lawsuits relating to—counterfeit ink. Lexmark declined all comment.

But William Duffy, Imaging Supplies Coalition president, says that some of the biggest counterfeit-ink suppliers operate in China, Malaysia, and Latin America, where government authorities have found falsified labels and packaging materials in raids of ink cartridge manufacturing plants.

Between October 2001 and March 2003, the U.S. Customs Service seized at least 18 shipments of counterfeit ink jet and toner cartridges in the port of Miami, most of them destined for Latin America. Three seized shipments, however, were believed to be headed for U.S. distribution points.

Federal court documents

A warehouse raid netted over 13,000 fake ink cartridges.

(www.omnipro.cc), a Web site owned by Ray Casa of Medley, Florida. "I had no idea [that the ink was counterfeit]," he says. Casa declines to identify where he purchased the ink.

Another bogus ink cartridge we obtained came from a Miami retail store, US Computer & Cartridges. "We cannot test every cartridge we sell," says

We got the third fake from Alameda Business Machines in Alameda, California. Owner Michael Wood says that his records do not show where the cartridge came from.

MOPPING UP

BROTHER, CANON, Epson, and Xerox shy away from giving specifics about domestic

CONSUMER ALERT

OUTFOX THE FAKERS: INK BUYING TIPS

PSST...WANNA BUY some name-brand ink for your printer on the cheap?

Not unless you want to risk standard prints, a messy ink spray, and serious printer damage—problems that have plagued people who unwittingly bought counterfeit ink in their quest to save a buck or ten. Telling the knockoffs from the genuine article is not always easy, but here are some shopping tips and indicators that should raise red flags.

No-name merchants: To reduce the odds of purchasing illegitimate ink, buy from an authorized retailer that the printer or ink manufacturer audits. You can check the ink manufacturer's Web site to obtain a complete list of its authorized resellers.

Suspect pricing: Know how much ink costs before you shop, and be cautious if you see exceptionally low prices. Although some counterfeit ink costs as much as the real thing, the bogus ink that *PC World* purchased had been discounted up to 40 percent below the manufacturer's suggested retail price.

Funny packaging: Fraudulent-ink packaging ranges in quality from amateurish to indistinguishable from the original it imitates. Most of the counterfeit-ink victims we talked to couldn't tell the differ-



ence, but you should still look for abnormalities such as misprinted stickers and packaging that's old or falling apart.

Running on empty: Phony ink jet and toner cartridges typically run dry unusually quickly because their tanks aren't full. Keep track of the average number of printouts you get with your ink cartridges, and be suspicious of ones that run dry extremely early.

Performance problems: Color ink is harder to counterfeit than black. Many of the phony-ink victims we interviewed kept cleaning their printers' printheads in a

vain effort to get the colors to look right. Compare the quality of great-looking printouts made with previous cartridges, and watch for differences in color between old and new samples.

Disasters: Bogus cartridges may leak, spit, or pop apart inside ink jet printers, creating messes that can take hours to clean. When replacing a cartridge that you've had good results with, do a side-by-side comparison with the new one and look for inconsistencies, particularly in molded plastic seams or in controller chips, if any. (Cartridges with integrated electronics are not as likely to be counterfeited as older, nonelectronic cartridges.)

indicate that Epson, Hewlett-Packard, Lexmark, and Seiko have filed separate lawsuits accusing U.S. companies or individuals of selling or making counterfeit ink.

In Canada, Yasar Sattar and his partner Delwir Sing Rai appeared in court in June on charges of fraud and counterfeiting. The February raid of their warehouses netted 13,195 Epson- and HP-labeled ink jet printer cartridges and 437 HP LaserJet cartridges—all fake—carrying a total value of \$534,000 if sold at retail, police records show.

The Canadian authorities allege that Multi-Tech sold phony ink to 276 eBay customers, primarily in the United States. A Canadian distributor called Amico Imaging bought another \$318,000 worth of the ink and resold it to stores in the United States, Canada, and Europe. Amico Imaging's president, Albert Frankel, says he had no idea that the ink he purchased for distribution was counterfeit.

INADVERTENT SALES

SO PROFITABLE is the ersatz-ink trade that it has attracted organized crime and (on occasion) terrorists, says Robert A. Levinson, managing director of the Latin American office of SafirRosetti, a consulting firm that helps ink manufacturers in their efforts to crack down on counterfeiting rings.

Possible links between bogus products (including cartridges) and terrorism have also attracted the attention of the Department of Homeland

Security. The National Intellectual Property Rights Coordination Center, which is chiefly responsible for intercepting counterfeit products that cross the U.S. border, is one of several federal agencies that are working with ink manufacturers to combat the problem.



GIGI DIGIACOMO, an agricultural economist, says the counterfeit cartridge that ruined her Epson printer looked exactly like the real one she's holding.

"There are strong indicators that proceeds of counterfeit products are going to fund terrorist organizations, but we have not made a definitive link," says NIPRCC director Nancy Sherman-Kratzer. "No matter what it is, if it's popular, then counterfeiters will copy it," she observes.

INVISIBLE INK

PRINTER VENDORS haven't widely publicized the problem of phony ink because they fear consumers might simply stop buying brand-name cartridges and purchase less-expensive third-party products instead.

But the printer industry may be shooting itself in the foot: If a customer who has a problem with brand-name ink does not suspect that it might be counterfeit, the manufacturer's reputation may take a hit.

Some vendors are trying to minimize customers' pain. Epson says use of counterfeit ink will not void a printer's warranty. Canon agrees, as long as users didn't know they bought bogus ink. HP says that technically any damage sustained as a result of using third-party inks (including fake HP inks) would void the printer's warranty, but that to help victimized customers HP would make specific determinations on a case-by-case basis.

If you suspect you've bought a fake ink cartridge that was supposedly from an Imaging Supplies Coalition member, visit the ISC's Web site (www.isc-inc.org) for information on submitting cartridges for testing. Report any problems with non-ISC members' products to the vendor's customer service department (customers of HP should call its fraud hotline at 877/219-3183). Testing could give you grounds for a refund and help vendors track sources of fake ink. For advice on avoiding counterfeits, see "Outfox the Fakers," page 28.

The high price of printer ink gives consumers good reason to seek cheaper alternatives. Next month we examine another source of inexpensive ink: third-party cartridges that are marketed as compatible with name-brand printers. ■

IN BRIEF

Product Pipeline



EASY ON THE EYES: Eyetop eyewear may look like a pair of ordinary sunglasses, but it's anything but. The foldable glasses include a miniature 320-by-240-resolution screen in one sidepiece that lets you watch videos and view images and other information. The Eyetop shades connect to a control unit that attaches to your belt and can link to most video sources (including a notebook PC) via an A/V output. find.pcworld.com/36335

THIN IS IN: Voltaflex is taking lightweight batteries to a whole new level. The company is working on very thin, rechargeable lithium and lithium ion batteries that look like a piece of paper. The flexible, thin-film batteries are designed to power such portable devices as handhelds and cell phones, providing a thinner, lighter, and safer power source.

Did You Know?

WE CONTINUE to use the Web to hunt for work. Over 17 million surfers—that's 13 percent of the active online population—logged onto a career site in April 2003, according to Nielsen NetRatings. Professionals were the likeliest to check career options online, with one in five logging onto a career site, the company reports.

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MILLION

STORAGE

BUYING DVD BURNERS GETS EASIER

MORE DUAL-FORMAT REWRITABLE DRIVES ARE COMING TO MARKET—AND LOWERING PRICES.

A RADICAL SHIFT is under way in the rewritable DVD drive market—and consumers are the winners.

Users can now stop puzzling over competing, incompatible rewritable formats and choose among several drives that support the two most widely compatible ones: DVD-R/RW and DVD+R/RW. And along with competing dual-format drives come lower prices.

Sony led the way last fall with the first drive to combine both main formats. Now several vendors such as Iomega, Memorex, NEC, Plextor, and TDK are offering dual-format drives; all models are just out or will ship later this summer. Market leader Pioneer notably switches to a dual-format drive after being a staunch advocate of the DVD Forum–endorsed DVD-RW format. And LG Electronics is making a drive that supports the -RW and +RW formats as well as DVD-

RAM (favored primarily for backing up and archiving PC data). We tested two shipping units of these second-wave drives, one from Pioneer and the other from TDK.

NO SPEED BOOST

YOU WON'T be buying one of the new drives to get more speed. Sony remains the leader on that count with its DRU-510A (see chart). Specs of the Pioneer DVR-A06 and the TDK IndiDVD Dual generally compare well with the DRU-510A's, but both new drives trail Sony's on CD and DVD+RW write speeds.

While the TDK's results are about what we'd expect from a model with those specs, the Pioneer drive took far longer to complete our write tests. Why? The DVR-A06 builds in full support for UDF 2.0 defect management both in its hardware and in software via



TWO OF A NEW CROP of dual-format DVD burners: the \$329 DVR-A06 from Pioneer and the \$299 IndiDVD Dual from TDK.

Software Architects' Write DVD packet-writing package. The software automatically initiates a write-verify cycle. But in ensuring data integrity, you trade off performance.

"With 2X media, it should give you the equivalent of a 1X write," says Andy Parsons, senior vice president of Pioneer USA's business solutions divi-

sion. He adds that after the first pass, the software will reverify the data only once every ten writes.

There is bad media out there, so if you have very sensitive data, this approach may make sense.

Dual-format support is more expensive. At \$329, the DVR-A06 costs about \$80 more (street) than its predecessor. And the \$299 IndiDVD Dual is about \$50 more than TDK's single-format models. But prices on these kinds of drives should drop overall. Both tested drives are cheaper than the \$350 Sony; as more drives hit the market, the trend will only continue.

HOLDOUTS

NOT EVERY vendor is leaping to dual-format. Toshiba's and HP's next drives will stick with one format only. Dean Sanderson, HP's director of product marketing for DVD, says that in the long term, maintaining multiple formats will be tough and will slow the evolution of the technology.

Vendors must eventually decide which formats to support to keep up in the speed race, says IDC analyst Wolfgang Schlichting. But over the long haul, multifunction drives may be most dominant in the aftermarket, he adds.

And right now, no matter which format you prefer, the harvest of new drives makes rewritable DVD a safer and more attractive investment.

—Melissa J. Perenson ■

TEST REPORT

NEW DUAL-FORMAT DVD DRIVES A MIXED BAG

TDK'S DRIVE is faster on write-once media; neither new drive beats the Sony on rewritable media.

DEVICE	VENDOR RATED SPEED FOR			TESTED SPEED IN MINUTES:SECONDS FOR			
	DVD+R/ +RW	DVD-R/ -RW/ROM	CD-R/RW	Write MPEG2 movie to DVD+R	Write MPEG2 movie to DVD-R	Format media and packet-write 1.18GB data to DVD+RW	Format media and packet-write 1.18GB data to DVD-RW
Pioneer DVR-A06 find.pcworld.com/36290	4X/2.4X	4X/2X/12X	16X/10X	6:16	6:26	164:14	106:59
TDK IndiDVD Dual find.pcworld.com/36290	4X/2.4X	4X/2X/12X	16X/10X	4:04	4:20	7:56	13:00
Sony DRU-510A find.pcworld.com/35495	4X/4X	4X/2.4X/12X	24X/16X	6:51	7:43	4:40	8:43



HOW WE TEST: We test rewritable DVD drives under Windows XP Home on PCs with 1.67-GHz Athlon XP 2000+ processors and 512MB of DDR SDRAM. To test each drive, we use the bundled DVD video authoring, mastering, and packet-writing software; we use vendor-supplied media or Verbatim media. Tests conducted by the PC World Test Center. All rights reserved. **CHART NOTES:** Italicized entry is a comparison product. Lower times are better. Each drive came with a different software bundle.



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CONSUMER ALERT

COPY CONTROLS CRACKDOWN

BATTLE RAGES ON SEVERAL FRONTS, BUT TECHNOLOGY OFFERS ANSWERS FOR BOTH SIDES.

MULTIMEDIA lovers find themselves caught in a digital vise these days, as Hollywood tightens its copyright controls on movies, games, and music on DVDs and CDs—most recently squeezing customers accused of copyright infringement in court. But even well-meaning consumers are feeling pressured (and baffled) by conflicting messages about what is allowed. Meanwhile, the courts and Congress mull legal answers to the ongoing digital rights struggle.

USERS UNDER FIRE

THE ISP Verizon Online recently buckled and gave the Recording Industry Association of America (RIAA) the names of four customers suspected of downloading large quantities of music from file-sharing sites in violation of the Digital Millennium Copyright Act. More than 40 privacy groups and ISPs are joining Verizon in fighting procedural

aspects of the copyright holders' demands. But it is clear that customer privacy has sustained a hit.

The RIAA also recently settled with four university students who ran Napster-like file-sharing networks campus-wide. Each agreed to pay \$12,000 to \$17,000, although the trade group had originally sought up to \$150,000 per song. The RIAA warns that it may not settle on such lenient terms in the future.

For the moment, peer-to-peer networks sporting a copy-for-free business model continue to thrive despite being mired in lawsuits. But the line demarcating the lawful use of file-sharing technology may be shifting.

In April, a federal judge in Los Angeles dismissed an RIAA suit against file-sharing services Grokster and StreamCast Networks (maker of Morphueus), holding that peer-to-



KIRBY KISH, Macrovision's digital technology director, says technology can keep up with digital copyright policy.

peer services are not liable for illegal file-trading over their networks. The RIAA is appealing the decision.

"That's the most important victory of the last three or four months," says Cory Doctorow, outreach director for the Electronic Frontier Foundation. Doctorow notes that it reinforces the Supreme Court's

so-called Betamax decision of 1984, in which the court refused to ban legitimate products or services simply because they could also be used for illicit activities.

Even the act of copying DVD movies has a chance to prevail in court: 321 Studios is taking on Hollywood by claiming the right to market its DVD copying software. Its preemptive lawsuit against the major movie studios challenges the Digital Millennium Copyright Act's constitutionality. At the heart of the case—taken under advisement by a federal judge in May—is consumers' right to make back-up copies of DVDs.

IN CONGRESS

CONGRESS offers the public little hope of quick action, but copy-control legislation is nevertheless in the spotlight.

Several pieces of legislation would require labeling of CDs or DVDs that use digital rights management technology (also known as DRM).

Other proposed measures would affirm consumers' right to back up digital material or to donate it, and try to balance fair use and copyright.

Also, the DMCA is undergoing its periodic review, facing several complaints about its regulation of copyright.

Ultimately, technology provides new opportunities for both vendors and users. Only 20 years ago, Hollywood feared piracy with the advent of ▶

UPDATE ON DVD COPYING APPS

WHETHER IT'S OKAY—or illegal—to make back-up versions of copy-protected DVD movies may be contested in court for some time to come.

But a pending federal ruling didn't stop scrap- 321 Studios from releasing a new, streamlined version of its program for copying even the longest movies onto a single disc. The earlier version, priced at \$99, nearly always required splitting the movie between two discs, but it copies all of the DVD's data; DVD X Copy Express copies only the movie and soundtrack.

PCWorld.com's downloads section includes a 14-day trial version of DVD X Copy Express (find.

pcworld.com/36272). A full version costs \$70.

Pinnacle Systems markets InstantCopy (retail price: \$50). The program can create, copy, and store just about any type of unencrypted video, audio, photo, or data disk. InstantCopy can also record movies onto a single DVD, but the software works only with movies that do not have copyright controls in place.

InterVideo recently released WinDVD Copy, which makes 1:1 copies of DVDs and CDs intended for archive and backup. The \$60 program cannot copy movies that are encrypted with the common CSS copy protection code.

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VCRs—but instead prerecorded videotape has become a lucrative market.

Today, “consumers want new ways to get content easily,” says Kirby Kish, director of digital technology for copy protection developer Macrovision.

Microsoft is licensing Macrovision technology for its Windows Media Player. The technology permits “dual sessions” on a disc, so that users can play the CD in a standard audio player but also can play a DRM-protected digital ver-

sion in another device. Alternatively, vendors could stuff the extra session with additional material.

“They’re still playing with a couple of different models, like bonus songs and other extra content,” says Yankee Group consumer technology analyst Ryan Jones.

As another example, this fall Disney is testing DVD discs that become unreadable after 48 hours of play.

Whatever the final outcome of the DRM wars, today’s dig-

ital technology is sufficiently flexible to give copyright holders many options on packaging content, Kish says.

“We really think of it as an enabling, not restrictive, technology,” Kish says. He believes that success is a matter of educating both sides about the different methods possible.

The methods all share one thing in common, however: Users will have to pay.

—Frank Thorsberg, with additional reporting by Elsa Wenzel of the Medill News Service ■

IN BRIEF

Product Pipeline



FLASHY STORAGE: The FlashTrax handheld device from SmartDisk provides portable storage for your multimedia files. Carrying a 30GB hard drive, a 3.5-inch LCD screen, and a CompactFlash slot, the unit can store, display, and play all types of multimedia files, including digital images, MP3s, and video. The \$499 FlashTrax connects to your PC via USB 2.0. find.pcworld.com/36332

Top 5 Downloads

Head to find.pcworld.com/36224 to find these files.

1. **Clean System Directory 1.7** 70KB
This software helps to remove stray DLLs from your system.
2. **Spybot Search & Destroy 1.2** 3.5MB
Protect your privacy by removing spybots and replacing them with empty dummies.
3. **ZoneAlarm 3.7.143** 3.6MB
Use this top-notch software firewall to defend yourself online—especially if you have broadband.
4. **Webwasher Classic 3.3** 1.1MB
Protect your sensitive files from threats that come from either inside or outside your network.
5. **SpamCatcher** 2.2MB
Block spam by creating rules that identify and blacklist bulk e-mail.

NETWORKING

BETTER 802.11 SECURITY

WI-FI NETWORKS GET SAFER WITH DOWNLOADABLE FIRMWARE.

IF YOU’VE delayed setting up a wireless network because of security concerns, help is at hand. Around the time you read this, improved security technology for all variants of 802.11 should be available as free firmware downloads from most equipment vendors.

The new technology—known as Wi-Fi Protected Access (WPA)—replaces the existing and largely discredited Wired Equivalent Privacy (WEP) security algorithm that is part of the 802.11a, 802.11b, and 802.11g standards. WEP became an obstacle to widespread business adoption of Wi-Fi when security experts showed that hackers equipped with off-the-shelf tools could easily break it. The relatively robust WPA supports user authentication by a dedicated server on a corporate network, while being versatile enough to work well on simple home and small-office networks.



The Institute of Electrical and Electronics Engineers, which develops 802.11 and other technical standards, was already working on 802.11i, a version with improved security. But that standard probably won’t be implemented for a year or more, and it may require hardware upgrades. So the Wi-Fi Alliance—the trade group that certifies the interoperability of its members’ products—decided to step in with interim technology that works with existing hardware.

WPA is actually a subset of 802.11i’s components. It uses

Temporal Key Interchange Protocol (TKIP), a more secure encryption-key technology than WEP’s RC4. When ready, 802.11i will incorporate an even stronger hardware-based encryption technology called Advanced Encryption Standard (AES).

If you’d like to beef up the security of your existing Wi-Fi network, check your equipment vendor’s site for a WPA firmware download. Make sure upgrades are available for all of your equipment: Some routers may work with WEP clients after the upgrade, but many probably will not. Vendors may not offer WPA software for all older products, but if your vendor does, you should use it. Among other things, this will prepare you for expansion: All new Wi-Fi products certified from September on will have WPA (instead of WEP) built in.

—Yardena Arar ■

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PERIPHERALS

FIREWIRE 800: FAST NOT FURIOUS

FIREWIRE INTERFACE JUMPS TO 800 mbps.

WANT FASTER external storage? Third-generation FireWire 800 (IEEE 1394b) claims to provide it, boasting a maximum data transfer rate of 800 megabits per second (about 100 megabytes per second). In our tests of the \$449 LaCie D2 200GB external drive—which works with FireWire 800 as well as with the older 50-Mbps FireWire 400 and 60-Mbps USB 2.0—FireWire 800 outpaced the other interfaces, but often by less than you might expect from the spec (see chart). Data-

read operations, such as playing back or editing multimedia files, showed the most benefit in our testing.

We did not use a striped RAID 0 setup in our assessment, but Mike Mihalik, LaCie's FireWire guru and prod-

uct manager, says the company's testing shows remarkable gains from multiple drives sharing the new bus. FireWire 400 and USB 2.0 lack the headroom to allow more than modest RAID speed gains.

While power users may dive right in, most people have no reason to switch yet. Your older FireWire equipment will not run any faster, and you must buy new cables to attach older four-pin devices to the new nine-pin bus. One other note: A FireWire 800 interface to an external drive won't yield improved performance unless the internal drive can make use of the extra bandwidth (more than 35 to 40 MBps).

Caveats aside, we liked the faster throughput of the new drive, and the potential for cheap high-performance RAID set-



LaCIE 200GB drive and PCI card.

ups (especially as network-attached storage) is tantalizing. In addition, FireWire 800 can run over 300 feet with special cables, which allows interesting networking and drive-sharing possibilities. Today, most FireWire 800 devices are external hard drives; DV equipment may get upgraded later. Our advice for now: Keep your older FireWire and USB 2.0 devices, and go for FireWire 800 either when prices drop or when maximum speed becomes paramount.

—Jon L. Jacobi ■

NO BARN BURNER

PORT	Average time in seconds to:	
	Write 10GB of data	Read 10GB of data
FireWire 800	713	498
FireWire 400	748	563
USB 2.0	766	785

Lower is better. All tests used the LaCie D2 external hard drive.

PDA OS

POCKET PC UPDATE: SO-SO

WINDOWS MOBILE 2003 BEEFS UP PDA WIRELESS, WEB FUNCTIONS.

MICROSOFT's operating system for handhelds is getting a facelift and a new name.

The upgrade, based on Windows Pocket PC 2002, will be branded as Windows Mobile 2003 (a name of future Smartphone OS upgrades also).

The latest PDA upgrade is by no means a must-have, but it does deliver assorted tweaks and may also be available as an easy download for some Pocket PC 2002 devices.

We tried Windows Mobile out on Hewlett-Packard's new IPaq H2210, as well as on a wireless-enabled Toshiba E755 with its OS upgraded.



HP's compact new IPaq H2210.

In using the E755, we found it easier to set up a Wi-Fi connection with Windows Mobile than with Pocket PC 2002, though the process still wasn't quite as simple as on Palm's

Tungsten C (see our review at find.pcworld.com/36239). Pocket Internet Explorer adds support for XHTML, CSS, HTML 4.0, Jscript 5.5, and other Web standards, which lets you access more Web content. The upgrade rendered popular Web sites legible on the Toshiba's small screen.

With the IPaq H2210, HP launches both the new OS and a compact new design. This moderately priced PDA is slightly smaller than the company's popular IPaq 5450 but larger than the slim, entry-level IPaq 1910. It has a Secure Digital card slot and a re-

movable, rechargeable battery. My one complaint: When you handle the device, you frequently end up muffling the speaker on the back.

Enterprises will appreciate the data security improvements, including a virtual private network client. And all users will benefit from minor datebook and calendar tweaks, such as improved search and time-zone handling.

Microsoft says that Dell, JVC, Panasonic, and Toshiba will offer the new OS. But don't rush to upgrade a 2002 model unless the price is right.

—Yardena Arar ■

IPaq H2210

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TROUBLESHOOTING TIPS

THE JUNE COVER story by Michael Desmond ["How to Troubleshoot the Worst PC Disasters"] could not have come at a better time. Two days after I received the magazine, my sister called and said she thought her hard drive had died: "It made a noise, and the screen went blank."

I was able to boot it, but after 10 minutes, the drive started clanking and then crashed. I booted to a floppy, but the C: drive could not be found.

Following the "Deep C: Salvage" tip on page 90, I put the drive into a freezer for a while—and it ran! It was only for 5 minutes, but by repeating the procedure a few times, I copied all the needed files.

Stan Hoffman, South Wales, New York

I HAD TAKEN some friends to the Grand Canyon for the first time. I took 20 to 30 photos with my digital camera. Thinking that I had safely transferred them to my computer, I deleted them from my SmartMedia card, but subsequently I could not find them anywhere, and the SM card read as empty when I put it back in my camera.

Then I noticed the item "Digital Photo Panic" on page 89 of your troubleshooting feature. I followed the directions for the undelete process, and voilà! There were my photos! This tip alone was worth the price of my subscription.

Ray Symons, via the Internet

IN THE "Problem Solvers" sidebar on page 91, item 5 states that Windows 98 lacks a System Restore utility of the sort available in Windows Me and XP. Windows 98 does, however, have a Registry restoration program that you can reach by booting to a command prompt and entering `scanreg/restore`; this generates a list of various Registry files by date, with their status, and you can select from among

these to replace the current Registry. I have used this feature to revive a number of machines that would not boot.

Walter Hess, Ironwood, Michigan

IN THE SIDEBAR "PC Survival Kit" on page 89, I think that it would have been good to point out that you should *not* use any magnetic screwdrivers, Torx drivers, needle-nose pliers, or anything else magnetic since magnetism can cause all sorts of trouble within a PC.

Laura Kuhn, Allen Park, Michigan

FIGHTING PHONE-BILL CRAMMING

THE ARTICLE "Mystery Web Fees Hit Phone Bills" [News & Trends, June] shed much-needed light on an incident with my October phone bill. The bill normally totals \$60 to \$70 per month. This time, it was over \$100. Looking closely, I found an unexplained \$34.95 charge levied by a company listed as Integretel. I immediately called my phone company's billing department. Asked if I had visited any Web sites recently, I said that, while I browse the Internet almost daily, I never authorized anyone (including Integretel) to charge anything to my phone bill. The representative removed the charge, explaining that it might reappear if Integretel proved its authorization was valid. I never saw the charge again.

Richard Kindall, Hays, Kansas

IT HAS BEEN almost two years since I discovered a fee on my Verizon bill for services from Voicenet that I had not ordered. Fortunately, I scrutinize my bills and never paid the fee. It took months of repeated phone calls to Verizon, Voicenet, and Integretel (the billing agent) to have the fees and interest charges removed. I arranged with Verizon that no third-

LETTER OF THE MONTH

The Other Broadway Photo

IN FEBRUARY you ran an article called "Camera Confidential" with a sidebar, "Anatomy of a Hard Sell," about Broadway Photo in New York City. However, besides the Broadway Photo in Brooklyn, known for complaints of bait and switch, there is another that's me—a lab in New Jersey that gets the Brooklyn Broadway's hate mail, e-mail, and yelling customers on the telephone, about orders we never heard of, or for cameras we never stocked!

I've even put a disclaimer on my Web site

(www.broadwayphoto.com) saying we are not affiliated, but people just don't get it!

I learned of your story only because someone e-mailed me about it, saying "I thank my lucky stars every day that I do not come into contact with a business that is run like yours."

I think the article is great! But I wish that the writer could make it clearer about which Broadway Photo is which.

*Josh Lynn, Broadway Photo
West Caldwell, New Jersey*



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party billing would be authorized on my phone bill in the future, so as to prevent any recurrence of the earlier problems. Verizon told me that I wouldn't be able to use any services requiring such billing, and I was just fine with that limitation.

Gail Becker, Hatfield, Pennsylvania

IT'S NOT THE SPECS

YOUR ARTICLE "LCD Specs: Useless?" [*News & Trends*, June] was admirable, but I think it misses one issue: preference. Specifications, though helpful, need to be put into context. Your *Top 100* is a much better way to evaluate equipment than worrying about specs alone.

Preference is a matter of what you need and can afford out of what is available on the market. If all the specs were completely accurate, this need/affordability issue would still not be addressed. Your holistic approach to product analysis is superior to any specs you may mention. And hands-on evaluations are probably the best test of all.

Jason McMahon, Dolgeville, New York

MULTIFUNCTION PRINTERS

I APPRECIATED the June article on multifunction printers, or MFPs ["Copy Shop in a Box"]. I wish, though, that you had also addressed software issues.

My current MFP, an HP LaserJet 3100, has intrusive, "arrogant" software that pops up in my system tray, on my desktop, and elsewhere. Because I have had to reinstall HP's JetSuite software several times due to driver problems, I've had to beat back this software repeatedly.

It also cost me \$23.76 for a new CD with drivers (and an updated version of the dreaded JetSuite) after I upgraded to

CORRECTIONS

IN THE "Buying Tips" sidebar of June's *News & Trends* story, "LCD Specs: Useless?" (page 26), we should have said buyers shouldn't settle for a response time of more than 16 milliseconds.

In June's "The Entertainers" (page 103), we should have identified the Logitech Z-680 as a 5.1-channel speaker set.

PC World regrets the errors.

XP Home. Unfortunately, there is really no way to learn about the software before you commit to the product.

Daniel Smith, Moraga, California

CHEAPER TWEAK

REGARDING MAY'S "Cheap Tweaks": Why anybody would pay \$50 for a USB device to hose music from a PC to a hi-fi is beyond me. All you need is a \$5 cable—a stereo-male-miniphono-plug-to-dual-male-RCA-plug patch cable. I've used them for over 38 years for all sorts of dubbing applications, and they work great on a PC. Get them at any electronics store.

P.C. (Mac) MacDonald, via the Internet
Editor's response: HiFi-Link comes with 30 feet of shielded studio audio cable and a 20-bit DAC in a shielded external sound card. Of course, if you can't hear the difference between that and a \$5 patch cable, you're right: It's a waste of money. —Dennis O'Reilly

FLASH VS. FLOPPY

IN THE JUNE ISSUE I noticed a letter stating, "the advent of the flash USB drive (aka pen or thumb drive) makes floppies unnecessary." I have to disagree. Until a system BIOS is able to recognize USB devices as a bootable source like floppies and CD-ROMs, there will be a need for the floppy. Floppies are still necessary for several troubleshooting utilities as well as virus tools that have to be run before the USB drivers are even loaded.

Ken Oppermann, via the Internet

THE FIRST EMOTICONS

"WHO INVENTED THE :-) Symbol?" [*Plugged In*, June] discussed the possible creation of the omnipresent emoticon.

With tongue planted firmly in cheek, though, I must point out that it was used hundreds of years before e-mail.

In the King James Version of the Old Testament, the English translators added a happy face emoticon—:)—in Genesis 49:24. A winking emoticon—;)—is found even earlier in the text, in Genesis 14:8.

Ken Alford, via the Internet

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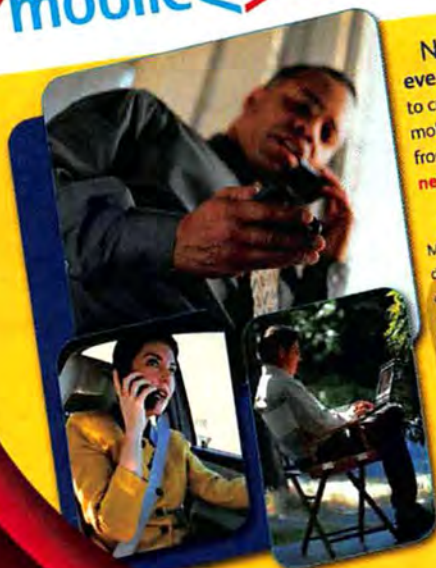
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1 Nigerian Scam's New Face

The Buzz: You know the infamous Nigerian e-mail scam—the one that asks for your help in getting millions of dollars out of Africa? That's old hat. The latest variations are more ingenious, and potentially more persuasive. There's the lottery e-mail (you "win" a foreign contest and must remit a fee before collecting), the bogus overseas job (you're offered employment), and the opportunistic Iraqi scam (which substitutes Iraq for Nigeria). The most insidious variation, though, is the auction rip-off: A foreign e-mailer offers to purchase an item that you're selling by online auction or through your local paper. (A relative of the buyer, who

lives in the States, will pick up the goods, you're assured.) When the buyer's check (which is counterfeit, natch) arrives, it's made out for thousands of dollars more than the winning bid. The scammer asks you to refund the difference, but says you can keep a few thousand bucks for the trouble. Trouble indeed.

Bottom Line: I prefer to think of this scam as an e-mail-administered IQ test. Fail it and you can join DENSA—Dupes Exploited by Nigerian Scam Artists.

2 Move Over, Wi-Fi

The Buzz: Just as you get used to Wi-Fi (802.11), along comes WiMax (802.16), a new wireless standard with a 31-mile range and a peak data rate of 70 megabits per second. (Wi-Fi covers 300 feet at 11 mbps.) It will initially be deployed across metro areas to extend wireless hot spots and bring high-speed access into homes and offices, but WiMax could eventually become your favorite way to get broadband. WiMax products from vendors like Intel should hit the market in 2004.

Bottom Line: Could WiMax eventually unseat Wi-Fi? Wi-Not?

3 More Pixels for Your Dollar

The Buzz: Artisan Entertainment's \$30 "Terminator 2: Extreme DVD" includes a bonus DVD that presents the movie in high definition—3.5 times the resolution of a standard DVD. The catch? The hi-def version requires a souped-up PC running Windows Media Player 9.

Bottom Line: Nice idea, but who wants to risk getting popcorn in their keyboard, let alone Media Player 9 (and its built-in copy protection) on their hard disk?



VALVE SOFTWARE'S upcoming Half-Life 2.

4 Real Zombies Real Soon

The Buzz: Based on early peeks, the two most breathlessly awaited games of the year—Half-Life 2 and Doom III—have achieved a whole new level of artistry and photo-realism. This fall, you'll finally have a real reason to buy that 3-GHz PC with the screaming-fast graphics card.

Bottom Line: Game developers are building the code that will eventually run truly useful virtual worlds and stores. In the meantime, we get lotsa purty stuff that blows up real good. ■

NAGGING QUESTION

When Did 'Geek' Become Chic?

WAY BACK WHEN—in, say, 1511, when Shakespeare used it to mean "fool"—the word *geek* was a flat-out insult. By the 1920s, geeks were circus performers who bit the heads off chickens. Later still, *geeks* referred to socially inept outsiders (aka losers). Not anymore. Starting in the early



1990s, computer-savvy types began to claim the word as their own, and geekiness became a badge of honor. As a *Mondo 2000* magazine article from 1993 states, "Geek is the proud, insider term for nerd. If you are not a dedicated techie, don't use this word." You've been warned.

Contributing Editor Steve Fox covers buzz-worthy products, ideas, and trends. Contact him at steve_fox@pcworld.com. Visit find.pcworld.com/31643 for more Plugged In.

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THE WIDENING WORLD OF WIRELESS COMPUTING

Best Buy leads the way to high performance

Low-cost wireless communications, which are available just about anywhere in the world today, have given lovers of digital gadgets a whole new perspective. Businesspeople can get the data they need wherever they are and whenever they want it. Consumers can be in touch as often as they want, when they want, and with whomever or whatever they want.

In addition, applications and files are getting larger, with more graphics and multimedia content fast becoming the norm. The question is, can the wireless networks provide the performance and speed to allow wireless users to do what they want to do—namely, to move big and complex files quickly?

The short answer is yes, thanks in part to a new wireless communications standard—802.11g—scheduled to become official this summer. As a result, wireless hardware and equipment conforming to the standard will be able to transmit and receive data five times faster than previously. So, for example, streaming video over a wireless network, which has been very difficult up until now, will become practical and affordable with 802.11g.

The current 802.11b standard, to which the great majority of wireless access points conform, will be replaced. However, hardware built to the new standard will be compatible with 802.11b—unlike products conforming to the 802.11a standard, which are not.

BEST OF BOTH WORLDS

Not surprisingly, some of the leading vendors in the industry are rushing 802.11g products to market. And fortunately for consumers, these products are available at very affordable prices and in ample supply through Best Buy (BestBuy.com), the largest-volume specialty retailer of consumer electronics, personal computers, entertainment software, and appliances.

Leading the high-speed wireless charge at Best Buy is the Linksys WRT54G wireless access point with cable/DSL router and 4-port switch. Capable of data transfer rates up to 54 MB/sec and fully compatible with 802.11b network equipment, the Linksys WRT54G has advanced data security features as well. The device has



The Linksys WRT54G wireless access point is just one of the high-performance products available at Best Buy.

a built-in 4-port 10/100 Ethernet switch with auto speed sensing as well as a simple, browser-based configuration utility.

The extra performance offered by the Linksys WRT54G allows users to share high-speed broadband Internet access as well as files and printers among multiple computers, with wires or without them. All this and more can be accomplished securely, thanks to the device's capability of up to 128-bit wired equivalent privacy (WEP) encryption.

NOTEBOOKS ON THE RUN

For many users, the notebook computer remains the device of choice for computing on the go. And just like devotees of handheld computing devices, these customers want the fastest wireless network speeds they can get.

For these users, Best Buy offers the D-Link DWL-G650 wireless notebook card. With simple installation and setup, this card is the notebook user's ticket to high-performance, high-productivity wireless computing.

The D-Link DWL-G650 is fully compatible with 802.11b networks, offering data transfer rates up to 54 MB/sec—significantly higher than previous network speeds. The D-Link DWL-G650 makes it more possible than ever before to have notebook computing your way, whenever and wherever you want and need it.



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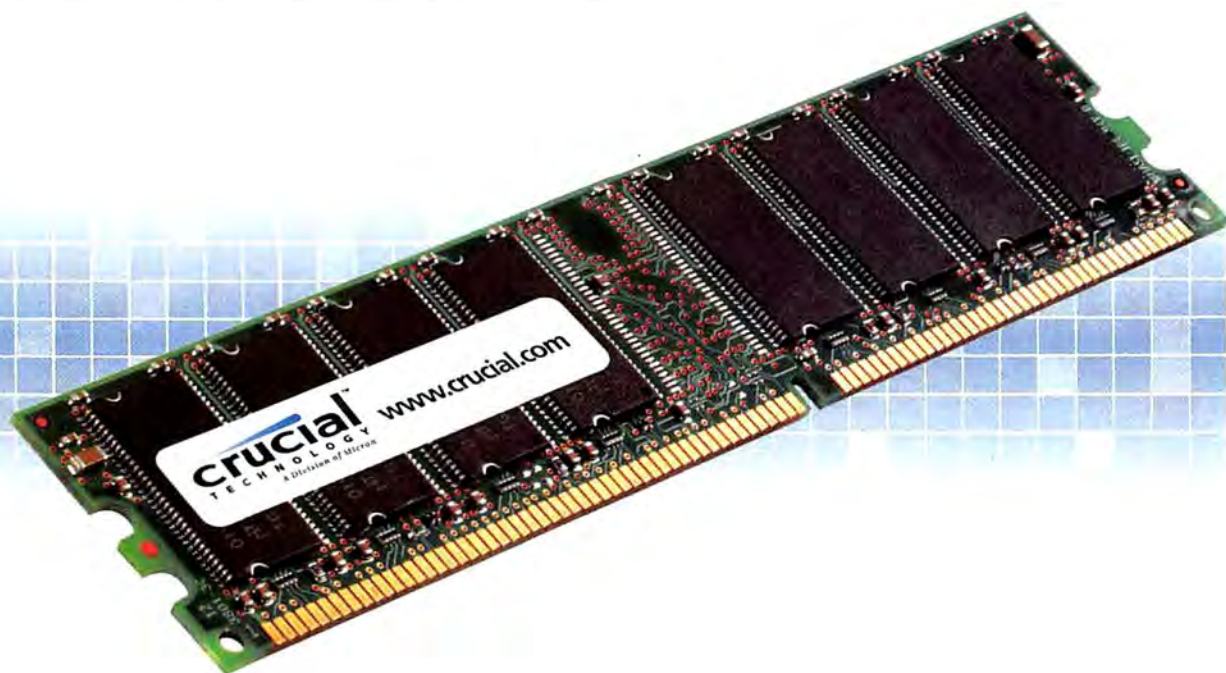
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You May Be Using the Wrong Browser

Sick of pop-ups and patches for IE? Try a different window on the Web.



WHICH WEB BROWSER do you use? If you're like most Internet users, it's Internet Explorer. And I'm guessing the main reason you use IE is sort of like George Mallory's explanation for taking on Mount Everest in 1924: Because it's there.

That's understandable. IE is reasonably fast and stable, it offers a decent assortment of features, and it's certainly easy to use. But it has plenty of shortcomings. For example, browsing in IE without an ad blocker means spending hours pouncing on pop-ups. And I'd give my right mouse button to be able to customize the interface or manage my bookmarks more efficiently. I have other gripes, too, which I'll discuss as soon as I download the IE security patch du jour from Microsoft.

While Microsoft has made an effort to improve some features—easier cookie management and more-accessible security settings come to mind—it hasn't kept pace with the rising tide of spyware, online ads, and security threats. So why hasn't IE gotten better? The answer lies in one statistic: 95 percent, the portion of surfers who use IE. With that kind of dominance, Microsoft doesn't have much motivation to improve. And now that Microsoft and America Online, Netscape's parent, have resolved their long-standing differences, AOL has little incentive to continue work on Netscape, IE's main rival.

Increasingly, I've found myself wondering if there isn't another browser that offers more of the features that I—and, I

suspect, plenty of other users—want. So I decided to check out the latest versions of a couple of alternatives.

I'm happy to report that at least two better Web browsers exist: Opera version 7.1 (www.opera.com), developed by Norway-based Opera Software, and Mozilla 1.3 (www.mozilla.org). (Mozilla is basically an open-source version of Netscape, but without the AOL marketing hype and, according to many users, with fewer bugs.) Both Opera and Mozilla are quick, easy downloads, and both programs are free (though if you want to get rid of the banner ad that sits next to Opera's taskbar, it'll cost you \$39).

What's so great about Opera and Mozilla? They seem to have been developed by people who really listen to what users want—and to what drives them crazy. If only we could say the same about IE.

POP-UP PROTECTION

TOPPING MY pet-peeve list is Internet Explorer's staunch refusal to help users block pop-up ads. Of course, you can always install a third-party ad blocker (visit find.pcworld.com/36236 for a few of PC World's favorites). But why go through that trouble? Both Opera and Mozilla let you forget with one click that the annoying e-intruders even exist. And both Web browsers will let you adjust the settings so that you still receive the pop-ups you want, like the broadcast window from your favorite Internet radio station.

A close second on my list of IE annoyances is the browser's habit of constantly opening up new windows. Whenever I so much as think about following a new link, my desktop seems to end up ►

with more windows than the Sears Tower.

Both Opera and Mozilla control the clutter by allowing you to display each new Web page on a tab (think of a segmented spiral-bound notebook) within the existing window. Instead of clicking your way through stacks of open windows, you simply click the tabs to switch from page to page.

With Opera, you can also save groups of pages into browsing sessions—a handy feature when you're researching a topic that you want to come back to later. For example, I recently helped a friend who's looking for a new house browse real estate listings online using Opera. We set up a session for each neighborhood, with separate tabs for each property; we could easily switch from listing to listing and

compare photos, prices, and features. And she could open the saved sessions later to show the research to her husband.

In fact, Opera and Mozilla both offer more customization tools than IE does. But Opera is particularly rich—sometimes overwhelmingly so—in choices.

MOUSE MOVEMENT

IF YOU PREFER using keyboard shortcuts to mousing, Opera provides a keyboard command for every conceivable function. For hard-core rodent lovers, Opera supports mouse gestures for frequently used browser functions. With gestures enabled, you can hold the right button and move the mouse slightly to the left to return to the previous page, for example. The tricks can speed up your

browsing, though to be honest I found some of them unwieldy.

Even if you don't care about any of the tools and enhancements Mozilla and Opera offer, wouldn't you love to see the last of Microsoft's incessant security updates for IE? It's no secret that when it comes to the s-word, IE's track record isn't exactly stellar.

Are alternative browsers any more secure? At the very least, they're not as prominent on hackers' radar screens. IE users, on the other hand, seem to browse with giant targets on their backs.

When it comes to managing cookies, passwords, and other security issues, IE has been historically slow on the uptake, though recent improvements in version 6 have made matters better. But Opera ►

PRIVACY WATCH

Growing Threat: Stalking Over the Web

WHEN AUTHOR Jayne Hitchcock found out about an online scam targeting writers, she wanted to fight back. So she posted an online message asking victims of the scam to speak up. But the scammers themselves saw her notice, and through the Internet they harassed Hitchcock and attempted to discredit her.

First the cyberstalkers posted lurid sexual ads online—with her e-mail address, home phone number, and home address attached. "People started calling me all day and night, looking for sex," Hitchcock says. Someone "e-mail bombed" Hitchcock's account, sending hundreds of messages to render the account useless. The harassment stopped only when postal inspectors arrested the two fraudsters.

By many reports, cyberstalking—using the Internet and electronic communications to harass and threaten people—is quietly going strong in the United States. Hitchcock, now the president of the anti-cyberstalking group Working to Halt Online Abuse

(www.haltabuse.org), says that her organization receives between 50 and 100 reports of cyberstalking or online harassment each week. Official statistics are harder to come by. The latest Justice Department statistics available report only the number of district attorney offices that prosecuted cyberstalking cases in 2001. In that year more than 75 percent of district attorneys in large, metropolitan areas of the United States did so, putting cyberstalking on a par with online crimes you've probably heard more about, such as identity theft and transmitting child porn.

Sometimes the smallest of slights will incite someone to cyberstalk, Hitchcock says. In 2002, WHOA found that 59 percent of victims had no significant previous contact with the stalker. A victim might have simply given a seller or buyer in an online auction a poor rating. Customers of online companies have launched harassment campaigns against business owners they don't even know.

One remarkable stalking case started when a stranger in a chat room told the victim that he didn't like the screen name she was using. The harassment ballooned, and the stalker was finally arrested after he tracked down the victim's work address and showed up carrying rope and duct tape.

All 50 states have laws that criminalize stalking, and the federal government can prosecute stalkers whose communication crosses state lines. But despite tough laws, the ability to mask one's identity and location online makes

life easier for cyberstalkers, according to Wayne Petherick, an Australian criminal profiler who specializes in stalking.

If someone harasses you online, ignore the person, Hitchcock recommends. "Defending yourself is the natural reaction when someone insults you, but it only feeds the stalker's rage," she says. Ask the administrators of online databases, such as Web phone books, to remove your personal information. Keep a log of everything the stalker has done and let someone you trust know what's going on. If you feel threatened by someone's online behavior, contact the police.

—Andrew Brandt





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and Mozilla generally give you more flexibility in handling cookies and passwords on a site-by-site basis.

Unfortunately, there's at least one sig-

nificant potential pitfall to using a non-IE browser: Occasionally you'll encounter a site that doesn't load correctly—or worse, doesn't load at all—because it was myopi-

cally designed to run on IE alone, or because of a Java or plug-in incompatibility.

If a site says it won't run on anything but IE or Netscape, try loading it anyway; many sites display just fine in Mozilla or Opera. But if you find yourself staring at gobbledygook in an Opera window, at least you'll likely have IE for a backup.

For most browsing, both Mozilla and Opera are a vast improvement over IE. But now that the fat lady has sung, I've turned into an Opera fan. It's not perfect, but it's small, fast, and secure, and it simply has more real-world, practical features than either IE or Mozilla.

Anne Kandra is a contributing editor and Grace Aquino and Andrew Brandt are senior associate editors for PC World. E-mail them at consumerwatch@pcworld.com. To read more Consumer Watch, Privacy Watch, or On Your Side columns, go to find.pcworld.com/31703, find.pcworld.com/31706, or find.pcworld.com/31709, respectively.

ON YOUR SIDE

Defective CPU, No Warranty

I SHORTLY AFTER I bought a generic PC from Mofidi Technology, I noticed something wasn't right with the AMD Athlon XP 1800+ processor. After a couple of weeks, the PC wouldn't boot. I called Mofidi for help but instead got the runaround for weeks—until the company went out of business. Then I sent the chip to AMD, thinking a tech would verify that it was defective and send a replacement. But AMD said it honors warranties only on chips purchased directly from AMD. Is this right?

*William E. Blasic
Union City, Pennsylvania*

On Your Side responds: I contacted AMD on Blasic's behalf. Company spokesperson Damon Muzny explains that if you buy a computer with a preinstalled AMD chip, the PC maker should support the entire system, including the CPU.

(If you buy an AMD chip through a retailer, such as CompUSA, the chip comes with a warranty. You should return any defective chip to the retailer.)

In Blasic's case, fixing the system was Mofidi's responsibility. But because Mofidi has gone belly-up, AMD promises to help Blasic get his PC up and running.

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Keep Your Files Within Easy Reach

These fab five freebies bring order to chaotic file systems.

WANT TO HEAR something shocking? The number of files on my PC is greater than the number of dollars I owe on my mortgage. That's over 100,000 files and folders. Right out of the box, most systems come with about that many files. Don't believe me? Go to Windows' Command Prompt (under *Programs > Accessories* in most versions of the OS) and type **chkdsk** to get a file count. It's no wonder you can't find that expense report from last April. But I have five file management utilities that'll get you organized, and they won't cost you a red cent.

The simpler your filing system, the easier it is to find and use your data. My system's pretty basic. Instead of following Uncle Bill's nutty idea of shoving everything in the My Documents folder, I have separate folders for each of my critical projects: One folder has *PC World* assignments, with subfolders for each month's *Home Office* column, each online newsletter, and each feature. I also have folders for photos, file attachments, downloads, the book I'm writing, and other topics. Don't sweat having too many folders. If you use Windows 98 or later, creating lots of folders won't waste hard-drive space.

My file structure makes it easy for me to find things quickly—and just as important, to move files from my digital camera or other external source to the right folder on my local drives. Go to find.pcworld.com/35516 to check out my file system.

If you sometimes feel lost in a blizzard of folders, try Fast Directory Finder. It's a nifty freebie that indexes folders and lets you find them in a jiffy, even if they're on a network. Head over to find.pcworld.com/35513 to download this program



and all the other utilities I mention below.

You can't do really smart file management with software as dim-witted as Windows Explorer. I'd bet the farm that once you try one of my two favorite Explorer replacements, V-Com's PowerDesk and Nikos Bozinis's 2xExplorer, you'll discover a ton of ways to wrangle your files. (Rest assured: No files were harmed in the writing of this column.)

DUAL-PANE RELIEF

POWERDESK GIVES you a better view of your files and folders through its dual panes. You can see all your files—even protected system files that Explorer hides by default—and you can attach a file to e-mail with a single click. For \$40, be a big spender and spring for PowerDesk Pro, which adds built-in file viewers (to see a file's contents without opening its app), color-coded folders, and multiple-file renaming. You can also convert images and create self-extracting .zip files.

Unfortunately, PowerDesk's built-in FTP feature, though cool when it works, crashes inexplicably. Also, any folder with

200 or more video or MP3 files stops PowerDesk cold. Adding notes to a file is great, but the notes don't follow the file when it's moved. Even so, I still recommend the program.

The utility chasing PowerDesk is 2xExplorer, an Explorer replacement that emulates the old Norton Commander for DOS. Its mirror browsing makes folder comparisons a breeze. 2xExplorer has a file editor, extensive wild-card filters, and an image viewer. You can split and remerge large files, and you can shred deleted files. Also included are a file finder and the ability to synchronize

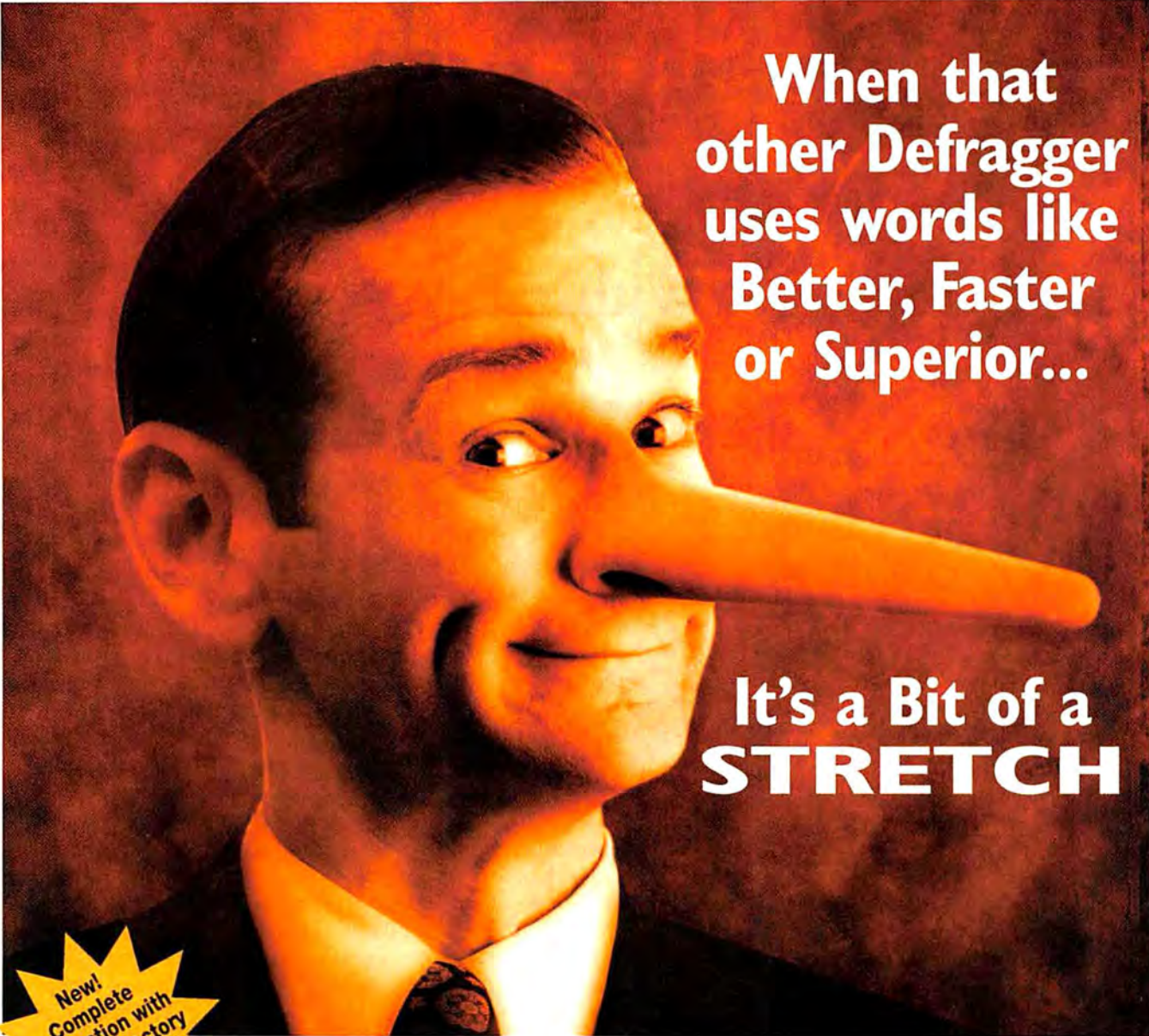
folders (but no FTP). I love the way the program lets me customize and save layouts, as well as bookmark specific folders.

If you stick with Explorer, grab two right-mouse-button freeware tools. RJH Software's RJH Extensions allows you to rename multiple files, which is great for those zillion picture files that all end up with names like 'epson001.jpg'. Also try Moon Software's FileTargets, which lets you select several folders and group them together, and then quickly move or copy files. FileTargets also lets you copy the file name and path to the clipboard.

Go to find.pcworld.com/35510 to read six great tips from Scott Dunn, our resident Windows whiz, on using Explorer to manage your sound and image files.

I'm out of room, but in upcoming *Home Office* newsletters you can read about other file tricks and utilities I use. Go to find.pcworld.com/25821 to sign up. ■

Contributing Editor Steve Bass runs the Pasadena IBM Users Group. Contact him at homeoffice@pcworld.com. Visit find.pcworld.com/31610 for more Home Office columns.



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BUGS & FIXES

STUART J. JOHNSTON

A Big Microsoft Mess: Patches Gone Bad

The company now says that XP performance issues don't warrant a remedy.



LAST WINTER, Devin Wood of Milford, Massachusetts, installed Service Pack 1 for Windows XP. Right after that, his PC got slower, and he's been unhappy with it ever since. "I'm sick of watching my desktop icons draw like someone is inside my computer with an Etch-A-Sketch," says Wood.

We received many similar reports from readers after SP1 rolled out (go to find.pcworld.com/36062). Several months later, Microsoft said that it had released patches to fix the performance snags. But now we get the bad news: Microsoft admits that it didn't address readers' problems, and the company says it has no plans to fix the situation at all.

Here's how the saga unfolded: When Microsoft first released the supposed fix, it told us that the only way to get help was to call Microsoft (see June's *Bugs & Fixes* at find.pcworld.com/36002). Hordes of unhappy XP users picked

up the phone. Some readers said company technicians told them there was no fix for XP performance woes. "The tech denied the problem [existed]," recalls Devin Wood. But other readers spoke to techs who were aware of the problem, and they received e-mail messages with a link to a fix. It turns out that some of these readers were directed to one patch, and others to a different (unrelated) patch. Neither fix took care of the problem. (If you installed either one of these two patches, your PC won't be affected, according to Microsoft.)

DOUBLE TROUBLE

THE FIRST PATCH, a "hot fix" labeled Q815411 (details at find.pcworld.com/36266) was aimed at a small set of corporate customers. Hot fixes are quickie patches that Microsoft creates when users run into specific problems.

"The patch was mislabeled," says Greg Sullivan, lead product manager with Microsoft's Windows group. "This enterprise hot fix was created for PCs running under very specific circumstances."

The second patch, labeled Q811493, was a revised security fix affecting Windows XP,

2000, and NT. Microsoft had to withdraw the original security fix because it introduced performance lags for some SP1 users. Visit find.pcworld.com/36011 and click *Technical Details* for Microsoft's notes about the reissued patch.

After this crazy runaround, we continue to receive readers' reports about sluggish PCs relating to SP1. Nevertheless, Microsoft doesn't believe that the problem deserves a patch.

"[We've] not received broad general feedback about performance issues with SP1," Microsoft's Sullivan tells us. "Therefore, [we're] not currently developing a widely applicable patch."

Some readers have uninstalled SP1 to get performance back. Visit find.pcworld.com/36005 for Microsoft's notes on how to remove SP1. Sullivan doesn't advise users to do this, but it seems to be your only (extreme) option. Sullivan also says that, in general, you don't need SP1 to get future updates, although some updates (known as quick-fix engineering updates) do require SP1.

Microsoft's site doesn't offer an easy way to submit a complaint. Send your SP1 reports to bugs@pcworld.com. ■

Stuart J. Johnston is a contributing editor for PC World. Visit find.pcworld.com/31580 to see more Bugs and Fixes columns.

IN BRIEF

Centrino Crashes

OWNERS OF Centrino-based portables may face "blue screens" when using VPN software. Intel advises you to disable PROSet Adapter Switching (see find.pcworld.com/36188). Nortel Networks offers a workaround for its Contivity VPN Client at find.pcworld.com/36191. Head to find.pcworld.com/36194 for our news story.

Microsoft Fakes

BEWARE OF e-mail messages that seem to be sent from support@microsoft.com. The messages have a subject line like "your password." But they are bogus. If you click a file attachment, you may unleash the Palyh worm. Go to find.pcworld.com/36017 for Microsoft's bulletin.

Player Update

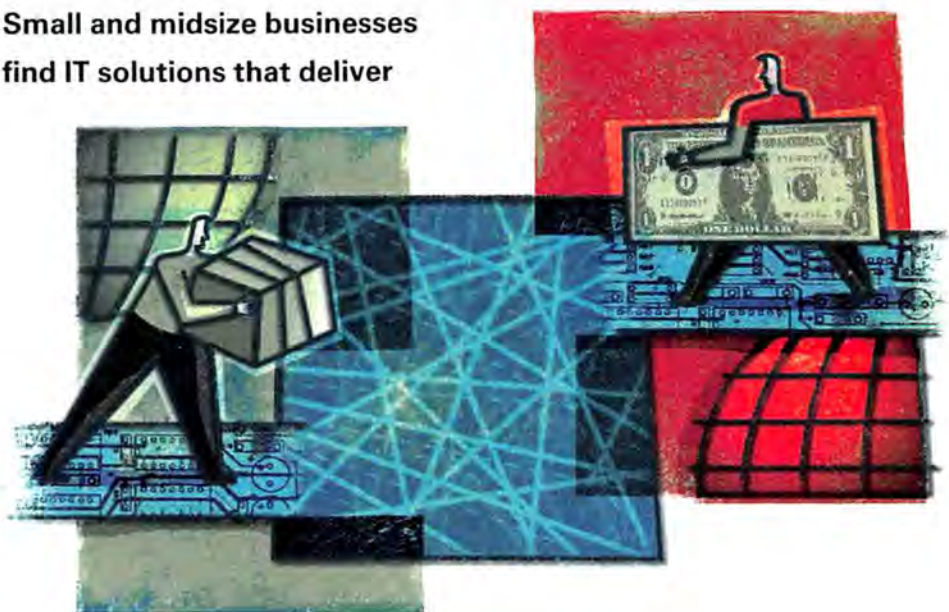
WINDOWS Media Player 7.1 and 8.0 have a flaw that could let a hacker take over your PC while you download new skins. Get the patch at find.pcworld.com/36023.

BUGGED?

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Real ROI For Real Companies

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Small and midsize businesses use a simple analysis to determine if a technology product delivers a worthwhile return on investment (ROI): the dumpster test. If you throw it into the trash and go back to doing business without it, then it doesn't deliver a sufficient ROI—failing the dumpster test. For example, shelfware—applications that someone purchased and tried, but never deployed—by definition fails the dumpster test.

Fortunately, shelfware in the small and midsize business market is uncommon, observes Carol Baroudi, president of Baroudi Bloor, a technology research firm in Arlington, MA. If the vast majority of the products these companies buy didn't deliver a worthwhile ROI, the dumpsters and alleys behind their buildings would be crammed with discarded laptops, accounting software, network cards, modems, and more.

Consider the many thorny issues small and midsize businesses must deal with today regarding data storage. As companies of all sizes become increasingly data-driven and data-dependent, finding efficient, optimal data storage solutions becomes a business-critical endeavor. But there's help. As an IDC white paper notes, "Network Attached Storage (NAS)

is an appropriate and cost-effective solution to address many SMB storage needs."

Built as single-purpose servers optimized for file sharing as well as backup and archiving, NAS appliances can extend the life of general-purpose servers by offloading basic file sharing. There are considerable cost savings associated with implementing NAS to increase storage capacity. NAS products are widely acknowledged as being easy to deploy—it often takes less than 15 minutes—and they include intuitive management consoles.

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stalled worldwide, is a recognized leader in the NAS domain. Iomega's NAS family of products offers highly comprehensive solutions that data-driven organizations require to maintain their competitive edge.

For starters, the Iomega NAS products are highly reliable. As one IT manager at a small company noted in the IDC white paper, his Iomega NAS products have suffered zero unplanned downtime in more than a year since they were deployed. And the man-

Continued on page 3

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The First Step on the Web™

Continued from page 1

ager was able to mothball two older and more expensive general-purpose servers as a result of installing the Iomega NAS solution.

In addition, the Iomega NAS family of products is compatible with a wide range of popular computing



platforms, offering easy connectivity and integration that reduces overall total cost of ownership. The products offer intuitive user

interfaces and the same management as a Windows-based server, optimizing limited IT resources.

■ For further information, click on www.iomega.com.

Boosting Website ROI with Register.com

"Small and midsize businesses get a substantial ROI from technology, but it is harder for them to quantify it," says Baroudi. These businesses simply don't spend enough on technology to justify the expenditure in time, effort, and dollars it takes to quantify an ROI for a given technology purchase.

Nonetheless, technology vendors are trying to increase the ROI for products aimed at small and midsize businesses primarily by reducing the cost of buying and deploying technology and technology services. One company, Register.com, has hit a sweet spot for small and medium-size businesses in a particularly vital area.

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have found a safe, secure, and easy way around this mission-critical task by using Register.com (www.register.com). A publicly traded corporation with annual sales in excess of \$100 million, Register.com offers the kind of financial stability and integrity on which a business can rely.

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Vendors Are Offering More Bang for the Buck

Many of the vendors Baroudi observes are taking the following steps to help increase ROI in small and midsize businesses:

- **Reducing the price**—the slow economy and cut-throat competition is leading to price-cutting and a willingness to negotiate
- **Modular packaging**—allowing buyers to purchase only the functionality they need, rather than an entire system
- **Easier, faster implementation**—enabling customers to get the product up and running and delivering results sooner and without the need for costly consultants

■ **Flexible licensing**—letting customers choose a license option that matches their particular situations, usage patterns, and budgets

■ **Deployment alternatives**—offering sophisticated applications as managed, hosted services

■ **Financing alternatives**—providing lease, purchase, or lease-to-own options

Although the measures above don't directly increase ROI, they can significantly reduce the cost of acquiring, deploying, and maintaining a product. This in turn makes it easier to realize a faster and larger return on a technology investment. Savvy customers will take note.

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R-Tools offers Rx for your mistakes

There is no such thing as an error-free computer user, regardless of experience. And the most common errors even seasoned users make are either deleting important files or keeping unwanted or unnecessary data in storage. Fortunately, before you can say "Oops," there is R-Tools Technology Inc. (www.r-tt.com), the leading maker of data recovery and undelete solutions for the Microsoft Windows environment.

The R-Tools' R-Studio data recovery utilities rescue data on both local logical and physical disks, and on remote disks over networks, regardless of whether their partition structures are damaged or deleted. R-Studio includes support for RAID and dynamic disk and for recovering encrypted files, compressed files, and alternative data streams. Flexible parameters give users absolute control over data recovery.

R-Tools' R-Undelete is a low-cost, user-friendly yet powerful file undelete solution capable of restoring deleted files on any valid logical disks visible to the host operating system. Together with R-Studio, R-Undelete can create an image file of any object the two recog-

nize—a very useful capability if there is a risk of total data loss due to hardware malfunction. All data search, scan, and recovery can be done from this image.

R-Tools' R-Mail tool is designed to rescue inadvertently deleted email messages and to recover damaged *.dbx files where folders with email messages are stored.

For users wanting to keep their disks free and clear of unwanted data, R-Tools offers R-Wipe&Clean. This highly useful tool irretrievably deletes private records of online and offline activities, including temporary Internet files, history, cookies, auto-complete forms and passwords, and other disk-clogging material.

■ Click on www.r-tt.com for more information on these exciting and practical tools from R-Tools.



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NEW PRODUCTS

EDITED BY TOM MAINELLI

Tablets Gain Oomph

**NEW PROCESSOR BOOSTS PERFORMANCE,
BUT BATTERY LIFE SUFFERS SLIGHTLY.**

MOBILE PCs

IF THERE'S A portable device that should benefit from Intel's Centrino technology, it's the Tablet PC. Centrino's combination of powerful Pentium M mobile CPU and wireless-networking hardware delivers the processing muscle to support digital ink capabilities, plus the connectivity to appeal to meeting-hopping office

workers. And any assistance in the battery-life department—another promise of Centrino technology—would make a Tablet PC all the more useful.

So it's small wonder that two of the first portable devices to use Centrino technology with ultralow-voltage versions of the Pentium M processor are Tablet PCs. Acer's **TravelMate C110** subnotebook and Motion Computing's **M1300** slate are second-generation versions of hardware that initially appeared with Microsoft's Windows XP Tablet PC Edition operating system last fall. If you want to get this latest technology,

however, you'll have to pay a slight premium over the price of previous configurations.

Does Centrino live up to its claims for Tablet PCs? In our tests of shipping units based on the 900-MHz Pentium M CPU, the performance rated a yes. Both devices scored significantly better than their ULV Pentium III-based predecessors on PC WorldBench 4. (The Acer used an 800-MHz chip; the Motion Computing, an 866-MHz CPU.) Unfortunately, battery life showed no such leap: Both units ran out of juice more quickly than earlier versions did.

Still, if you intend to make great use of the operating system's digital ink features, the tangibly snappier performance makes purchasing a Centrino Tablet PC worthwhile.

ACER'S CONVERTIBLE

THE TRAVELMATE C110 subnote (\$2099) has a slightly curved keyboard and a 10.4-inch screen that swivels, folds back over, and snaps to the keyboard, transforming the unit into a tablet. I found the 3.4-pound C110 somewhat sturdier than its predecessor, the C100, whose screen never felt securely fastened to its

keyboard. On the new device, however, the display looked somewhat washed out.

On our PC WorldBench 4 test suite, the C110 posted a score of 100—a full 33 percent higher than the C100's mark (note, though, that the new model includes an additional 256MB of memory). Centrino's 802.11b Wi-Fi worked fine, but using it would shorten battery life to less than the 2 hours, 49 minutes the unit managed in our tests (we disabled Wi-Fi before running all battery tests). The C100, using the same battery technology, lasted 6 minutes longer.

The C110 offers expansion possibilities, including VGA (video out), ethernet, modem, infrared, FireWire, and two USB 2.0 ports, plus one Type II PC Card slot and a connector for an optional \$124 port replicator, which is new with



MOTION
Computing's M1300.

M1300

Motion Computing
\$2106

★★★★☆

A large-screen slate with pricey but top-quality options.

find.pcworld.com/36179

TravelMate C110

Acer
\$2099

★★★★☆

Well-built convertible subnote could have a brighter screen.

find.pcworld.com/36182

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Acer TravelMate C110, Motion Computing M1300

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Audiotrak Prodigy 7.1

MP3 PLAYER

Apple 30GB iPod

MULTIMEDIA LINKING SERVICE

Muse.Net

GPS RECEIVER

USB Earthmate

82 **WIRELESS****KEYBOARDS**

A4Tech Full

Comfort Wireless

Desktop, Inter-

link Electronics

VersaPoint

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SMALL-**OFFICE****NETWORK****APPLIANCE**

Emergence IT-100



80

TEST REPORT

Centrino Tablet PCs Arrive

PENTIUM M-BASED units ratchet up system performance, but battery life fails to improve.

TABLET PC	CPU	RAM (MB/type)	Hard drive (GB)	Screen size/weight	PC WorldBench 4 performance score Faster	Battery life (hours: minutes)
Acer TravelMate C110	900/600-MHz ULV Pentium M	512/ DDR266	40	10.4 inches/ 3.4 pounds	100	2:49
Motion Computing M1300	900/600-MHz ULV Pentium M	512/ DDR266	20	12.1-inches/ 3.3 pounds	103	3:00



HOW WE TEST: Performance scores are based on PC WorldBench 4 tests, which use real-world applications. To determine battery life, we run a series of tests, each with a device's power management set to maximize the life of the battery. Tests designed and conducted by the PC World Test Center. All rights reserved.

this model. A button that turns off the Wi-Fi radio is handy for people who want to use the notebook on airplanes.

My unit included a FireWire DVD-ROM/CD-RW combination drive; skip the drive, and the price drops to \$1899. An optional \$219 USB 2.0 CD-ROM drive is also available. The Tablet PC comes bundled with Alias SketchBook Pro, FranklinCovey TabletPlanner, and Zinio Reader software. All in all, Acer's new C110 is a serviceable no-frills device that should appeal to subnotebook fans with a yen for digital ink.

MOTION'S SLATE

THE MOTION COMPUTING M1300 tablet, sold under both the company's own brand and Gateway's, offers a more upscale slate-style design, with a 12.1-inch screen. The standard \$2106 device has a basic stand and a notebook-size key-

board; my shipping unit also came with the optional \$230 docking station and a \$330 FireWire DVD-ROM/CD-RW drive (an optional FireWire CD-ROM drive costs \$150).

The M1300 earned a PC WorldBench 4 score of 103, about 17 percent better than the older M1200's score of 88. Again, however, battery life declined—from 3 hours, 18 minutes for the M1200 to 3 hours flat for the M1300, which uses the same battery technology as its predecessor.

The software bundle includes Colligo's application for ad hoc Wi-Fi networks. Using it, you can set up a wireless network with colleagues and visitors without having to connect via your office's existing wireless access point or router, which can be tricky due to office security measures.

At 3.3 pounds, the M1300 is

just a little bit lighter than the Acer (both weigh about the same as their predecessors). I'd recommend the M1300 to those seeking a larger screen without a big weight increase.

The introduction of Centrino technology in Tablet PCs does nothing, of course, to reduce the price premium that you'll pay for a Windows XP Tablet PC-based portable over a laptop PC with comparable features. After you add

necessary accessories such as optical drives, you can expect to spend in excess of \$2200—which would buy a Centrino-based thin-and-light notebook from a top-tier vendor.

Tablet PCs are still not for everybody: For one thing, the handwriting recognition remains shaky. But for anyone who wants to scribble notes and drawings, either in the included Tablet PC utilities or in a growing number of third-party apps, these Centrino-based models deliver snappier digital ink than previous units for a moderately higher cost. Just don't expect to receive a battery-life boost.

—Yardena Arar ■



ACER'S NEW
TravelMate C110.

Corel's Stellar Painter 8 Makes Art Easy

GRAPHICS SOFTWARE

MANY FEATS OF human dexterity don't translate to a computer environment: shaking someone's hand, playing a guitar, performing open-heart surgery. But Corel's **Painter 8** makes the delicate art of painting on a digital canvas not just possible but fun.

Ideally used with a drawing tablet, Painter 8 is a highly creative application that successfully mimics creating art with charcoal, watercolors, and oil paint. Daub the on-screen "pa-

per" with a watercolor paint, for example, and the media bleeds and runs realistically, even after you lift the brush.

I tried a \$299 shipping version that includes 400 more brush types than the previous edition (you can also create your own). You can achieve different textures by varying the pressure you apply to the drawing tablet, as well. Similarly, a new paint mixer works the way spreading paint on a real palette does, letting you create subtle color variations.

Painter 8 offers numerous other enhancements over version 7, including a better interface, faster response times, and additional customizable features. As with Adobe's Photoshop, you can create multiple layers; in addition, Painter

8 lets you make layer masks, in which you can add new effects as layers without modifying the original image.

Painter 8's revised interface makes it feel somewhat like an Adobe application, with

tool modifiers residing in a bar across the top, and layer and channel palettes along the right side of the screen.

I found plenty to like in Painter 8. In the hands of a real artist—or even of a stick-figure artist like me—it offers features that truly inspire.

—Alan Stafford

Painter 8

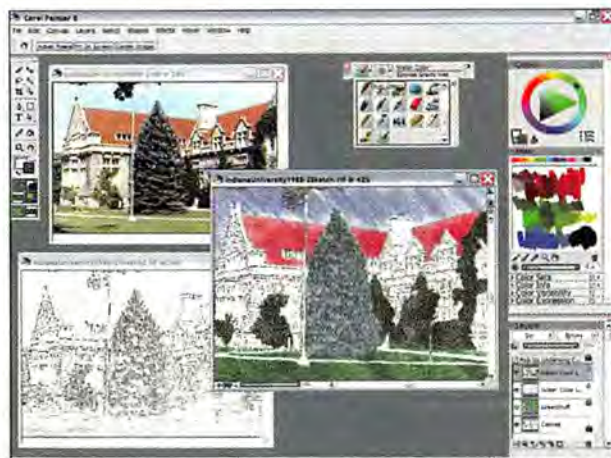
Corel

★★★★★

A toolbox that offers infinite possibilities—minus the cleanup.

List: \$299

find.pcworld.com/35939



COREL'S PAINTER 8 lets you import photo images, convert them into sketches, and then repaint them using a wide assortment of brushes.

Intuos2 Goes Platinum

INPUT DEVICES

THE SHINY new Platinum version of Wacom's Intuos2 graphics tablet is designed to look right at home in a digital artist's workspace. But don't let its pretty face fool you: This is one serious input device.

I tested a \$370 shipping example of the 6-by-8-inch version of the Intuos2 **Platinum**

Edition, which provides an aesthetic overhaul of the existing Intuos2 line. The 9-by-12-inch Platinum Edition is priced at \$490; smaller, non-Platinum units start at \$200.

Though primarily the province of designers, graphics

tablets such as the Intuos2 are an excellent alternative to the ubiquitous mouse for computer users looking for more-precise cursor control, or battling repetitive stress injuries. Except for the scroll wheel, the Intuos2 pen duplicates every mouse function, and offers pressure sensitivity as well.

If you still need a mouse, the Intuos2 doubles your input pleasure by including Wacom's cordless, three-button 2D Mouse, which retails for \$50 when sold separately (the 9-by-12-inch Intuos2 comes with the five-button 4D Mouse, which is normally \$70).

Wacom improved the Intuos2's looks with the Platinum Edition, but the software bundle remains the same. It features Adobe Photoshop Elements 2, Corel Painter Clas-

sic, and Wacom's own brush presets for Photoshop. Intuos2 users also qualify for discounts on design software; for example, you can buy Corel Painter 8 for the upgrade price of \$149 (versus the full version at \$299).

If your work doesn't require a graphics tablet, justifying the Intuos2's cost can be difficult. But if price isn't an obstacle, you'll be hard-pressed to find a graphics tablet that does the job better.

—Dennis O'Reilly ■

Intuos2 Platinum Edition

Wacom

★★★★★

The Cadillac of graphics tablets gets a spiffy new look (but the same software bundle).

Street: \$370 (6-by-8-inch)

find.pcworld.com/36218



WACOM'S SLICK new Intuos2 Platinum Edition graphics tablet.

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Safer Surfing With Steganos



STEGANOS'S Internet Anonym 5 alters your IP address to throw off Web spies.

P R I V A C Y
CONCERNED that unscrupulous Web sites may be tracking your every move on the Internet? Steganos's \$25 **Internet Anonym 5** keeps out prying eyes but exacts a heavy toll in Web-browsing performance.

Anonym 5 foils online marketing spies by funneling your Internet travel through an ever-changing series of proxy servers. These rotating servers generate a constantly shifting IP address for your PC, pro-

tecting your privacy as you browse and shielding other Internet-related applications from scrutiny.

In addition, the program blocks cookies, ActiveX controls, scripts, and pop-up windows. Some of the tools here are available in current Web browsers, and others can be had as free utility downloads, but only Anonym 5 brings them all together in a single, easy-to-use interface.

Most of the app's features

are set-and-forget, but erasing traces of online activity is a manual affair. The Internet Trace Destructor feature obliterates IE's browsing history, in addition to dozens of otherwise-hard-to-delete files. It also disables features of Windows and applications that might other-

wise report your activities to other parties. Finally, the tool wipes out lists of recently used files, logs, and caches that reside in your media players, as well as in archive utilities.

Internet Anonym 5

Steganos

★★★★☆

Perfect for paranoid surfers, but it slows down the action.

List: \$25 download, \$30 boxed, \$16 upgrade

find.pcworld.com/36128

QUICK TAKES

Better Backup

DANTZ'S \$90 **Retrospect Professional 6.5** backup software is easy to use, powerful, and capable of backing up open files in Windows XP. It supports hard drives and a good assortment of tape and optical drives, and it lets you safeguard two additional computers over a network. find.pcworld.com/36116

—Rex Farrance

My shipping Anonym 5 did its job well. Unfortunately, the program slowed my broadband Web browsing to a crawl, particularly at sites that require frequent communication with the browser. Before you buy, be sure to consider the trade-offs between security and your need for speed.

—Scott Spanbauer

HP's \$800 Color Laser

P R I N T E R
HEWLETT-PACKARD'S lowest-priced color laser printer ever, the **Color LaserJet 1500L**, offers high-quality output for small- and home-office users ready to make the leap from ink jet to laser printing. To reach that low price, however, HP had to cut some corners.

I compared the 1500L's output with prints from some of our top-rated color lasers, and with prints from Minolta-

QMS's \$699 **Magicolor 2300W** reviewed in our June issue (see find.pcworld.com/36068). I found the 1500L's monochrome text crisp and sharp, comparable to the text from more-expensive printers. In color graphics it matched up well against higher-priced HP color lasers. The 1500L produced photos that were slightly grainier than those from similar color lasers, but photo edges were smooth and color reproduction was excellent.

In additional tests, the LaserJet 1500L printed text at 10.9 pages per minute and color graphics at 2.2 ppm—comparable to the speeds of other budget color laser printers.

Notwithstanding its numer-

ous printing strengths, the 1500L has some notable weaknesses. Like most low-priced lasers, the unit ships with a weaker processor and less on-board memory than high-end units do, relying on the computer to process and render pages (fortunately, most of today's PCs have plenty of power to spare). Also, you get no ethernet port (only USB 2.0), so sharing requires Windows networking or a print server.

Most frustrating, however, is the unit's wimpy fold-out paper tray, which projects a full 10 inches into your desk space while holding only a scant 125 sheets.

Unfortunately, to upgrade to the 250-sheet drawer you must pay another \$300, wiping out the attractive price.

For HP loyalists who don't object to refilling the paper tray repeatedly, the 1500L represents a decent value. But I'd recommend the Minolta-QMS **Magicolor 2300W** for everyone else; it combines slightly better output and a 200-sheet paper tray at a lower price.

—Paul Jasper ■

Color LaserJet 1500L

Hewlett-Packard

★★★★☆

Affordable price and good-quality prints, but a shoddy print tray. Street: \$800

find.pcworld.com/36071

THE INEXPENSIVE
HP Color LaserJet 1500L.



PHOTOGRAPH: MARC SIMON

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Dell's Powerful Subnote

PORTABLE PCs

TO ACHIEVE a lightweight, compact package, subnotebooks typically compromise both speed and battery life. But Dell's new \$2285 **Latitude D400** has top-notch speed, provides lengthy battery life, and weighs just under 4 pounds.

In fact, this Centrino-based compact system offers all the power you need to get even your most demanding work done. Its PC WorldBench 4

score of 129 is the fastest we've seen—beating notebooks with twice its heft—thanks partly to its new 1.7-GHz Intel Pentium M chip. And though its 4 hours, 18 minutes of battery life wasn't as good as the 7 hours that some of our other high-scoring Pentium M test notebooks achieved, those machines were larger and carried notably bigger batteries.

The powerful Latitude D400 carries 512MB of SDRAM, a roomy 40GB hard drive, Intel's 802.11b wireless and ethernet networking, and a modem. The keyboard is a little less than full size but comfortable. You get both a touchpad and an eraserhead, but the two do not quite work together seamlessly (I noticed a slight lag

when I tried to use both). I preferred to disable one.

Dell bucks the trend in ultraportables of including an optical drive, which is unfortunate since the D400 seems thick enough to accommodate one. This means that any kind of CD, DVD, or floppy drive has to be external. Our shipping unit came with a somewhat bulky 8X DVD-ROM and 24X/10X/24X CD-RW combination drive; the drive attaches to the notebook via Dell's odd-looking two-tier D/Bay connector, which doubles as a second USB 2.0 port. The D400 also comes with a FireWire port, a Type II PC Card slot, and a Smart Card slot.

My only other complaint regarding the D400—and most



DELL'S
Latitude
D400.

notebook PCs this size—is the 12.1-inch screen. Here the diminutive viewing area seems more noticeable because of the screen's large bezel, which makes it look like the unit could support a larger display. Such minor quibbles aside, however, the D400 gives you a lot of laptop for your money.

—Anush Yeghazarian

Latitude D400

Dell

★★★★☆

An affordable portable powerhouse, but an integrated optical drive would have been nice.

Street: \$2285

find.pcworld.com/36155

Trendware Offers All-Weather Wireless

NETWORKING

YOU WOULDN'T expose most networking equipment to the elements unless the hardware already belonged in the Dumpster. But Trendware's \$699 **Trendnet TEW-212APBO** wireless access point and router begs to go outside, because the company designed the 802.11b device to be mounted outdoors.

Designed to offer a more focused area of network connectivity than standard access points do, the unit is most effective when it resides outside near a public space where laptop users congregate. Or you can use it as a wireless bridge, stretching access between two separate buildings. Finally, while the company doesn't suggest this, you can

also mount it on a roof, pointed downward, to serve several interior floors of the building.

The unit's design makes it look more like a futuristic



THE Trendnet TEW-212APBO.

component of an Abrams tank than an ordinary access point. Powered via ethernet cable encased in tough rubber seals, the TEW-212APBO can withstand a wide range of temperature and humidity condi-

tions; it comes with a built-in heater, which enables it to function well in even the most frigid temperatures.

The radio transmitter itself is no slouch either, offering a powerful 20dBm networking signal. Although we did not test Trendware's claim of a 3.5-kilometer range for the device, during tests at several locations we obtained superb network connections through concrete walls, layers of stucco, and standard roofing.

To complete this solid bundle, Trendware adds standard 128-bit WEP encryption, a configurable access-control list that prevents unautho-

rized users from getting into the network, and a built-in firewall and router. Other extras include diagnostic tools such as a site survey scanner and live traffic monitor.

At \$699 the TEW-212APBO is too pricey for casual home users and for small businesses better served by multiple inexpensive access points. But companies seeking a solid and secure wireless network that targets a well-defined area—indoors or out—will find plenty to like in this sturdy device.

—Andrew Brandt ■

Trendnet TEW-212APBO

Trendware

★★★★☆

Rugged, full-featured 802.11b access point with serious business appeal.

List: \$699

find.pcworld.com/35999



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Audiotrak's Prodigy Is No Mozart

SOUND CARD

THE AUDIOTRAK **Prodigy 7.1** sound card deftly utilizes Via's Envy 24HT audio chip to create clean, clear sound at a reasonable \$99 price. However, installation problems and poor drivers prevent me from recommending the card.

The Prodigy 7.1 offers an interesting technology called Advanced NSP (Native Sound Processing) that, combined with other driver features, gives you a remarkable degree of control over how the card routes and processes sound. Music enthusiasts can use Ad-



THE PRODIGY 7.1's control panel offers many audio-tweaking options.

vanced NSP to apply a broad array of real-time effects such as reverb and equalization, and to simulate different room environments.

Unfortunately, a lack of attention to detail in my shipping unit's drivers and installation program marred the product's clear sound performance. I experienced several problems with NSP effects, as well as a loss of audio when my Windows 2000 test PC resumed from suspend mode.

Worse yet, Audiotrak's Web site makes updating drivers needlessly complicated.

Deficiencies like this overshadow the Prodigy's high-quality sound and make it a poor buy. For a better Envy-based option, consider auditioning the M-Audio Revolution 7.1, which we reviewed in our April issue (find.pcworld.com/35957). That card lacks some extras, but it delivers smooth sound without hassle.

—Eric Dahl

Prodigy 7.1

Audiotrak

★★★★☆

High-quality sound card is saddled with problems.

Street: \$99

find.pcworld.com/35960

Slick New iPod Even Better

MP3 PLAYER

APPLE MAKES the best hard-disk-based MP3 players, and the company's redesigned, third-generation **iPod** elegantly drives home that point.

I squeezed my entire MP3 collection onto a shipping version of the 30GB unit and fell in love with its evolved looks, great display, intuitive interface, and high-quality sound. Regrettably, it's a love that can never be, as I don't have \$499 to spend on an MP3 player.

In addition to increasing the capacity of the iPod (up from

20GB), Apple tweaked its exterior, replacing the push buttons around the touch wheel with four red, glowing touch-sensitive buttons that reside



APPLE'S LATEST iPod and its equally aesthetic new dock.

under the display. I like the new layout and controls, but some users may miss the earlier version's tactile response.

Software improvements include additional customized menu options, on-the-go playlists, and a few extra games. Apple includes Musicmatch software for the PC; later this year it will launch a Windows version of its slick iTunes program, which lets you access its online music store (see find.pcworld.com/36281).

Finally, the iPod's new dock simplifies syncing and offers an audio line-out jack. I connected the player via a FireWire port; alternatively, you can use USB 2.0 with an optional cable (though you must power the iPod separately).

QUICK TAKES

Muse to Go

FOR \$20 PER year, the **Muse** Net service lets you listen to MP3s residing on one PC from any second Internet-connected PC (as long as both have broadband). In addition, the latest plug-in allows WinAmp users to listen from within the popular digital audio player—no Web browser is required. find.pcworld.com/35903

—Richard Baguley

Quick-Connect GPS

CONNECT Delorme's \$129 **USB Earthmate** GPS receiver to your notebook PC or PDA, and you'll soon know your place in the world. Despite its diminutive size, the unit locked on to my position surprisingly well. Plus, you get Delorme's latest Street Atlas. find.pcworld.com/35948

—Tracey Capen



Apple has improved upon an already great product, creating an MP3 player that I'd be happy to own. Nevertheless, the price tag seems artificially high, especially considering that Creative Labs offers the spacious 60GB Nomad Jukebox Zen—a less-attractive but capable unit—for \$100 less.

—Tom Mainelli ■

30GB iPod

Apple

★★★★☆

Best hard-drive MP3 player gets better, but price is prohibitive.

List: \$499

find.pcworld.com/35963



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Wireless Keyboards Evolve

INPUT DEVICES

A KEYBOARD and mouse may not have the sex appeal of a new LCD, but everybody has to have them—and two wireless bundles are proof that you can improve upon the basics without spending a fortune.

A4Tech's \$80 **Full Comfort Wireless Desktop** bundle includes a unique keyboard that has a numeric keypad on its

left side (most keypads reside on the right). The placement of the keypad is a boon for left-handed users, but as a righty I didn't take long to adapt (I had more problems with the main keyboard's oddly shaped keys). A4Tech cleverly leaves the cursor-arrow keys on the right side, so you can navigate with your right hand and insert numbers with your left.

The bundle also has a basic scroll mouse; both

devices use standard RF technology. The wireless PS/2 receiver ingeniously doubles as a recharger for the included batteries, which makes this distinctive and comfortable set even more of a bargain.

Interlink Electronics' \$99 **VersaPoint Communicator** bundle targets mobile users, providing a wireless keyboard and mouse, plus a handheld presentation remote control. All three units work well at up to 30 feet from the standard RF receiver, which is a thumb-size USB dongle.

Interlink's small scroll-wheel mouse is more suited for travel than for continuous desktop work. The highly responsive remote has preset buttons that are ready to use for Microsoft PowerPoint slide shows. The keyboard takes two AA batteries; the mouse, two AAA bat-

teries; and the remote, a single flat camera battery. All batteries are included.

Both of these keyboards are well made: Lefties will embrace the Full Comfort keyboard; frequent travelers will appreciate the VersaPoint bundle.

—Michael S. Lasky



A4TECH'S Full Comfort Wireless Desktop.

Full Comfort Wireless Desktop

A4Tech

★★★★☆

Wireless set stands out with left-handed keypad, battery charger.

List: \$80

find.pcworld.com/35942

VersaPoint Communicator

Interlink Electronics

★★★★☆

Bonus remote makes this wireless set a bargain.

List: \$99

find.pcworld.com/35945

Big Networking in a Small Box

SMALL OFFICE

SETTING UP A small- or home-office network can be like hooking up a complex home stereo system: Unless you know plenty about the equipment and how to troubleshoot it, putting it all together can be a nightmare. That's why many people prefer a simple, self-contained boom box for music. It's also why EmergeCore's **IT-100** net-

work appliance, nicknamed IT in a Box, is so appealing.

The IT-100 combines Internet connection sharing and routing; a four-port hub; and Web, e-mail, and file-serving capabilities. Plus, it has 20GB of storage, a firewall, virtual private network support, and 802.11b wireless access—all inside a slim, 10-inch-tall, fanless box. The only missing feature is a print server, which EmergeCore says it left out to avoid problems with Windows printer compatibility.

For a product geared toward users who are not technology-savvy, EmergeCore's meager 13-page manual leaves plenty to be desired (the Web site offers a slightly better version). Despite this, installation went

well—until I reached DHCP setup (the protocol that assigns dynamic IP addresses within a network). Though the software has a setup form, the manual provides scant advice on how to complete it.

After negotiating that hurdle, I ran into another issue, finding no way to enter my ISP-assigned user name and password for my PPPoE-based modem. The company says a free update to correct this problem is in the works.

Once I had the unit up and running, routine administration was easy, operation was reliable, and wireless performance was satisfactory.

Despite a few setup problems, the IT-100 is generally easy to install and run, and



THE IT-100 makes small-business networking simple.

free online upgrades should help smooth the rough edges and increase the unit's already impressive features list.

—Jamie Fenton ■

IT-100

EmergeCore

★★★★☆

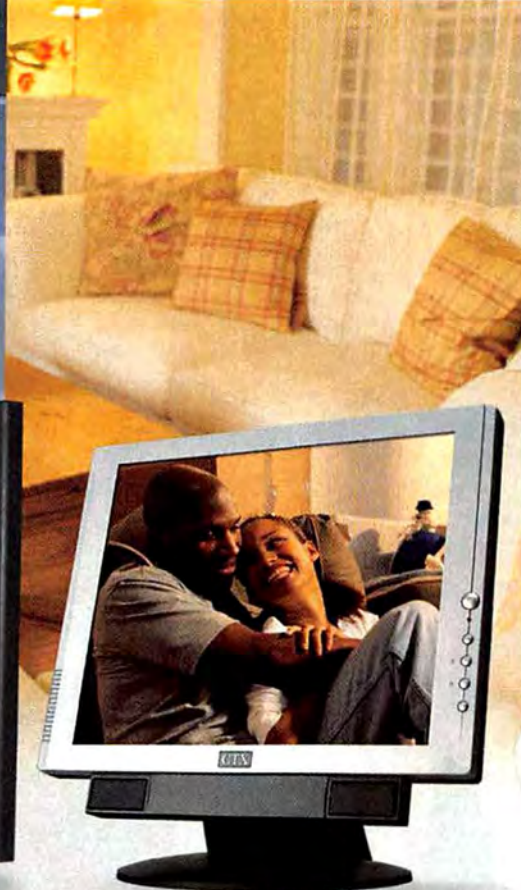
Easy-to-use bundle fills most small-office networking needs, but implementation calls for further polishing.

List: \$1395

find.pcworld.com/36122



Model: PD-4600 (46-inch plasma)



Model: PV722E 17" LCD
P922E 19" LCD
(w/ USB 2.0 & DVI)



Model: PS-5140
(1400 lumens)

Display products to fit every need.

In the office, on the road, or at home, CTX's full range of display products offer crisp images, brilliant colors, vivid brightness, and rich feature sets that satisfy the most discriminating eye and set a new standard for value.

CTX's new plasma display, featuring 46-inch widescreen, super thin 9.8cm depth, DVI Input and WOW surround sound, is the ideal fit for customers who need high-end displays for home, corporate, government, or education use.

From the value series up to the high-end professional series, CTX's LCD and CRT monitors fit every price, feature, and application requirement.

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(800) 555-MALL

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(800) 888-4437

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(800) 408-9663

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Who says simple PC questions always have to be answered by your IT staff? They don't with IBM technology that puts help right at user's fingertips. A wealth of information is just a click away. Which means your staff can focus on bigger issues like improving network security and developing mission-critical applications. And the Intel® processors ensure exceptional performance for everyone. So take advantage of our innate expertise. While making the most of your own. **think resources**

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Save on shipping. Order online.¹²

IBM ThinkPad® T40

Distinctive IBM Innovations:

- Access IBM — simplifies access to online¹ and on-system information
- IBM Embedded Security Subsystem 2.0¹

System Features:

- Intel® Centrino™ mobile technology
 - Intel® Pentium® M Processor 1.3GHz supports Enhanced Intel® SpeedStep™ technology²
 - Intel® PRO/Wireless Network Connection 802.11b³
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM std/2GB max⁴
- 30GB hard drive⁵
- Ultrabay™ Slim DVD-ROM
- 5.5-hr Li-Ion battery⁶ • 4.5-lb travel weight⁷
- Microsoft® Windows® XP Professional⁸
- 1-yr system/1-yr battery limited warranty⁹

\$1,599*

► NavCode 2378D2U-M230

ServicePac® Service Upgrade:¹¹
3-yr Onsite Repair/9x5/Next Business Day Response

#30L9195

*243

IBM ThinkCentre™ A50

Distinctive IBM Innovations:

- IBM Rapid Restore™ PC software — One-button data-recovery and restore solution

System Features:

- Intel® Pentium® 4 processor 2.4GHz
- 128MB DDR SDRAM memory¹
- 40GB hard drive • CD-ROM
- Integrated 10/100 Ethernet
- Microsoft® Windows® XP Professional²
- 1-yr limited warranty with limited onsite service³

\$799

► NavCode 83201EU-M230

Post-Warranty Maintenance: 2-yr Onsite Repair/9x5/Next Business Day Response

#96P2076

*188

IBM ThinkPad Accessories

40GB USB 2.0 Portable hard disk with Rapid Restore™

#09N4255

*299

IBM ThinkCentre Accessories

15" TFT Analog Flat Panel Monitor with system purchase

#15TFTB1

*299

onsite service is available varies by machine, but may include the processor, power supply, heat sink, system board or base cover. To determine the complete list of parts for which onsite service is available for a particular machine, contact your IBM representative. IBM will attempt to diagnose and resolve any problems remotely before sending a replacement part or technician. These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Not all machine types and models are covered. Service period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are response-time objectives and are not guarantees. A service technician is scheduled to arrive at your location within two or four business hours or the next business day (depending on service) after remote problem determination is completed. For the 9x5x4-hour service, calls dispatched after 1:00 p.m. local time, you can expect the service technician to arrive by the morning of the next business day. For noncritical service requests, a service technician will arrive by the end of the following business day. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. External peripherals, such as racks, tape drives and channel controllers, require their own, separate service coverage; they are not covered under the attached Machine. Service activation is required immediately following purchase. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. For failing non-IBM components, customer must provide replacement part unless IBM has a Technical Support Agreement with the manufacturer. Service does not cover accessories, supply items and certain parts such as batteries, frames and covers. Standard shipping included when you order online. U.S. only. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. All IBM product names are registered trademarks or trademarks of International Business Machines Corporation in the U.S. and other countries. Lotus and SmartSuite are registered trademarks of Lotus Development Corporation, an IBM company. Intel, Intel Inside, the Intel Inside logo, Celeron, Intel Centrino, the Intel Centrino logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. © 2003 IBM Corp. All rights reserved.

There are lots of ways to save IT resources. Let's start with these 14.



IBM ThinkPad G40

Distinctive IBM Innovations:

- Access IBM — Simplifies access to online¹ and on-system information

System Features:

- Intel[®] Celeron[®] processor 2.0GHz²
- 14.1" XGA TFT Display (1024x768)
- 128MB DDR SDRAM³
- 20GB hard drive • CD-ROM
- 1.5-hr Li-Ion battery • 7.6-lb travel weight
- Microsoft[®] Windows[®] XP Home
- 1-yr system/battery limited warranty⁴

\$949*

NavCode 23861CU-M230

ServicePac[®] Service Upgrade:⁵
3-yr Depot Repair
#30L9192 **132**

IBM ThinkPad R40e

Distinctive IBM Innovations:

- IBM Rapid Restore[™] PC software — Managed data backup and recovery solution

System Features:

- Mobile Intel[®] Celeron[®] processor 1.8GHz
- 14.1" XGA TFT Display (1024x768)
- 128MB DDR SDRAM
- 20GB hard drive • CD-ROM
- 2.1-hr Li-Ion battery • 5.9-lb travel weight
- Microsoft[®] Windows[®] XP Professional
- 1-yr system/battery limited warranty⁴

\$1,079

NavCode 2684G8U-M230

ServicePac[®] Service Upgrade:
2-yr Onsite Repair/9x5/Next Business
Day Response
#30L9189 **197**

IBM ThinkPad X31

Distinctive IBM Innovations:

- IBM Embedded Security Subsystem 2.0

System Features:

- Intel[®] Pentium[®] M Processor 1.3GHz supports Enhanced Intel[®] SpeedStep[®] technology
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM • 20GB hard drive
- 5.0-hr Li-Ion battery • 3.6-lb travel weight
- Microsoft[®] Windows[®] XP Professional
- 1-yr system/battery limited warranty⁴

\$1,549

NavCode 2884BNU-M230

ServicePac[®] Service Upgrade:⁵
3-yr Onsite Repair/9x5/Next Business
Day Response
#30L9195 **243**

IBM ThinkPad T40

Distinctive IBM Innovations:

- Access Connections software simplifies management of multiple connectivity environments

System Features:

- Intel[®] Centrino[™] mobile technology
- Intel[®] Pentium[®] M Processor 1.3GHz supports Enhanced Intel[®] SpeedStep[®] technology¹
- Intel[®] PRO/Wireless Network Connection 802.11b²
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM • 30GB hard drive
- Ultrabay[™] Slim DVD-ROM
- 5.5-hr Li-Ion battery • 4.5-lb travel weight
- Microsoft[®] Windows[®] XP Professional
- 1-yr system/battery limited warranty⁴

\$1,599

NavCode 2378D2U-M230

ServicePac[®] Service Upgrade:
4-yr Onsite Repair/9x5/Next Business
Day Response
#69P9194 **399**

IBM ThinkPad G40

Distinctive IBM Innovations:

- Access Connections software simplifies management of multiple connectivity environments

System Features:

- Intel[®] Pentium[®] 4 Processor 2.4GHz²
- 15" XGA TFT Display (1024x768)
- 256MB DDR SDRAM
- 40GB hard drive
- CD-RW/DVD-ROM combo drive
- Integrated Wi-Fi wireless technology³
- 3.5-hr Li-Ion battery • 8.5-lb travel weight
- Microsoft[®] Windows[®] XP Professional
- 1-yr system/battery limited warranty⁴

\$1,399

NavCode 238433U-M230



IBM ThinkPad R40

Distinctive IBM Innovations:

- IBM Embedded Security Subsystem 2.0¹

System Features:

- Intel[®] Centrino[™] mobile technology
- Intel[®] Pentium[®] M Processor 1.3GHz supports Enhanced Intel[®] SpeedStep[®] technology¹
- Intel[®] PRO/Wireless Network Connection 802.11b²
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM • 40GB hard drive
- Ultrabay[™] Plus CD-RW/DVD-ROM combo drive
- 5.6-hr Li-Ion battery • 6.1-lb travel weight
- Microsoft[®] Windows[®] XP Professional
- 1-yr system/battery limited warranty⁴

\$1,449

NavCode 289734U-M230

ServicePac[®] Service Upgrade:
3-yr Onsite Repair/9x5/Next Business
Day Response
#30L9195 **243**

IBM ThinkPad X31

Distinctive IBM Innovations:

- IBM Rapid Restore[™] PC software — Managed data backup and recovery solution

System Features:

- Intel[®] Centrino[™] mobile technology
- Intel[®] Pentium[®] M Processor 1.4GHz supports Enhanced Intel[®] SpeedStep[®] technology¹
- Intel[®] PRO/Wireless Network Connection 802.11b²
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM • 40GB hard drive
- IBM Embedded Security Subsystem 2.0
- 5.5-hr Li-Ion battery • 3.6-lb travel weight
- Microsoft[®] Windows[®] XP Professional
- 1-yr system/battery limited warranty⁴

\$1,799

NavCode 2884CRU-M230

ServicePac[®] Service Upgrade:
4-yr Depot Repair
#69P9195 **249**

IBM ThinkPad T40

Distinctive IBM Innovations:

- IBM Embedded Security Subsystem 2.0

System Features:

- Intel[®] Centrino[™] mobile technology
- Intel[®] Pentium[®] M Processor 1.4GHz supports Enhanced Intel[®] SpeedStep[®] technology¹
- Intel[®] PRO/Wireless Network Connection 802.11b²
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM • 30GB hard drive
- Ultrabay[™] Slim CD-RW/DVD-ROM combo drive
- 5.5-hr Li-Ion battery • 4.5-lb travel weight
- Microsoft[®] Windows[®] XP Professional
- 3-yr system/1-yr battery limited warranty⁴

\$1,849

NavCode 2379D3U-M230

ServicePac[®] Service Upgrade:
5-yr Onsite Repair/9x5/Next Business
Day Response
#69P9200 **449**

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Warranty Information: For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, NC 27709. IBM makes no representation or warranty regarding third-party products or services. *Prices do not include tax or shipping and are subject to change without notice. Reseller prices may vary. Requires Internet access, not included. ¹With Intel SpeedStep, processor speed may be reduced to conserve battery power. For ThinkPad and ThinkCentre models without a separate video card, memory supports both system and video. Accessible system memory may be up to 8448 less than the amount stated, depending on video mode. ²GB = 1,000,000,000 bytes when referring to storage capacity. Accessible capacity is less. Up to 3GB is available in service partition. ³These model numbers achieved eSATA Labs, Inc.'s BatteryMark[®] 4.0.1 or the Ziff Davis Media, Inc.'s Business Winstone[®] 2002 BatteryMark version 1.0 Battery Runtime Time of at least the time shown. This test was performed without independent verification by the VeriTest testing division of Lionbridge Technologies, Inc. ("VeriTest") or Ziff Davis Media, Inc. neither Ziff Davis Media, Inc. nor VeriTest makes any representations or warranties as to these test results. Winstone is a registered trademark and BatteryMark is a trademark of Ziff Davis Publishing Holdings, Inc., in the U.S. and other countries. A description of the environment under which the test was performed is available at bm.com/comp/ibm/thinkpad/battery/BatteryLifeAndRechargeTimes. Will vary based on many factors including screen brightness, applications, features, power management, battery conditioning and other customer preferences. ⁴Includes battery and optional travel bag(s) instead of standard optical drive or Ultrabay, if applicable. Weight may vary due to vendor components, manufacturing process and options. Thickness may vary at certain points on the system. Some software may differ from its retail version, if available, and may not include user manuals or all program functionality. Software license agreements may apply. Telephone support may be subject to additional charges. If a machine is listed as having "Onsite service for select repairs" or "Limited" onsite service, this means that onsite service is available only for the replacement of select parts. For all other warranty repairs, IBM will provide the customer a replacement part for customer installation. The parts for which onsite service is available varies by machine, but may include the processor, power supply, hard disk, system board, or base cover. To determine the complete list of parts for which onsite service is available for a particular machine, contact IBM. IBM will attempt to diagnose and resolve any problems remotely, before sending a replacement part or technician. These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Not all machine types and models are covered. Service period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are resource-time objectives and are not guarantees. A service technician is scheduled to arrive at your location within two or four business hours or the next business day (depending on service) after remote problem determination is completed. For the 9x5x4-hour service, calls dispatched after 1:00 p.m. local time, you can expect the service technician to arrive by the morning of the next business day. For nonpriority service requests, a service technician will arrive by the end of the following business day if the machine problem turns out to be



(monitor not included)



(monitor not included)



IBM ThinkCentre A30

Distinctive IBM Innovations:

- Access IBM — simplifies access to online and on-system information

System Features:

- Intel® Celeron® processor 2GHz
- 128MB DDR SDRAM memory¹
- 40GB hard drive • CD-ROM
- Integrated 10/100 Ethernet
- Microsoft® Windows® XP Professional
- 1-yr limited warranty with limited onsite service²

\$499

NavCode 819912U-M230

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/Next Business
Day Response

#54P1861 '132

IBM ThinkCentre A50p

Distinctive IBM Innovations:

- IBM Rapid Restore™ PC software — One-button data-recovery and restore solution

System Features:

- Intel® Pentium® 4 processor 2.67GHz
- 256MB DDR SDRAM
- 80GB hard drive • CD-RW
- Integrated 10/100 Ethernet
- Microsoft® Windows® XP Professional
- 3-yr parts/1-yr limited onsite service limited warranty³

\$899

NavCode 843296U-M230

ServicePac® Service Upgrade:
4-yr Onsite Repair/9x5/Next Business
Day Response

#69P9158 '198

IBM ThinkCentre M50

Distinctive IBM Innovations:

- IBM Rapid Restore™ PC software — One-button data-recovery and restore solution

System Features:

- Intel® Pentium® 4 processor 2.4GHz
- 256MB DDR SDRAM memory
- 40GB hard drive • CD-ROM
- Integrated 10/100 Ethernet
- Microsoft® Windows® XP Professional
- 3-yr limited warranty with limited onsite service⁴

\$979

NavCode 8187A1U-M230

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/4-hr Response

#41L2734 '129

IBM ThinkCentre M50

Distinctive IBM Innovations:

- IBM Embedded Security Subsystem 2.0

System Features:

- Intel® Pentium® 4 processor 2.67GHz
- 512MB DDR SDRAM
- 40GB hard drive • CD-ROM
- Integrated 10/100 Ethernet
- Microsoft® Windows® XP Professional
- 3-yr limited warranty with limited onsite service⁵

\$1,099

NavCode 8187DDU-M230

ServicePac® Service Upgrade:
4-yr Onsite Repair/9x5/4-hr Response

#69P9162 '250

IBM @server xSeries™ 205VL

Distinctive IBM Innovations:

- Diagnostic LEDs, Automatic Server Restart™ & Predictive Failure Analysis™ help to improve uptime
- IBM Director 4.1 Software — IBM Director 3.1 recipient of *PC Magazine's* Editor's Choice on October 1, 2002

System Features:

- Intel® Celeron® processor @ 2.00GHz
- 128MB ECC memory/40GB EIDE HDD
- 1-yr limited warranty with limited onsite service⁶

\$499*

NavCode 848095X-M230

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/Next Business
Day Response

#69P9509 '149

IBM @server xSeries 225

Distinctive IBM Innovations:

- Diagnostic LEDs, Chipkill™ Memory, Automatic Server Restart™ and Predictive Failure Analysis™ help to improve uptime
- IBM Director 4.1 Software — IBM Director 3.1 recipient of *PC Magazine's* Editor's Choice on October 1, 2002

System Features:

- Intel® Xeon™ processor @ 2.40GHz
- Dual processor capable
- 512MB ECC memory/6 Hot-Swap Drive Bays
- 1-yr limited warranty with limited onsite service⁷

\$1,269*

NavCode 86473AX-M230

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/4-hr Response

#96P2249 '600

Service Upgrades

Protect your notebook with IBM ThinkPad Protection service. It covers accidental damages like drops, spills or damage to your ThinkPad LCD display. (Not available in all states; ask your sales representative for details.)⁸

1-yr Depot to 3-yr Onsite + 3-yr ThinkPad Protection #58P8772 '389
3-yr Depot to 3-yr Onsite + 3-yr ThinkPad Protection #58P8774 '299

IBM @server xSeries Accessories

20/40GB TR7 Tape Drive™ #48P7042 '499
IBM Remote Supervisor Adapter #09N7585 '499
APC Smart-UPS 700 #94G3134 '319
256MB ECC Memory (x205VL) #10K0067 '199

IBM ThinkCentre Accessories

IBM Multi-Burner #22P6970 '299
Belkin Wireless Keyboard and Mouse Kit #22P7139 '40
Lexmark X6150 All-in-One #22P9146 '160

IBM ThinkPad Accessories

Targus DEFCON Cable Lock #22P4751 '31
40GB USB 2.0 Portable Hard Disk Drive with Rapid Restore #09N4255 '299
Targus DEFCON PC Card Fingerprint Reader #31P6763 '175

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Small Business to Microsoft®
Office XP Professional
with Publisher.**

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Save on shipping. Order online.¹¹

IBM recommends Microsoft® Windows® XP Professional for Business.

a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. External peripherals, such as racks, tape drives and channel controllers, require their own, separate service coverage; they are not covered under the attached Machine. Service activation is required immediately following purchase. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. For failing non-IBM components, customer must provide replacement part unless IBM has a Technical Support Agreement with the manufacturer. Service does not cover accessories, supply items and certain parts such as batteries, frames and covers. ¹Requires download of client software. ²Standard shipping included when you order online. U.S. only. ³Based on IEEE 802.11b. This wireless LAN product has been designed to permit legal operation worldwide in regions in which it is approved. Operation on channels 12-14 is not permitted in all regulatory regions of the world. Consequently, the wireless LAN feature is limited to operate on channels 1-11 and will not support channels 12, 13 and 14. This product has been tested and certified to be interoperable by the Wireless Ethernet Compatibility Alliance and is authorized to carry the Wi-Fi logo. ⁴Power management features may reduce processor speed when in battery mode. ⁵These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Not all machine types and models are covered. Service period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are response-time objectives and are not guarantees. A service technician is scheduled to arrive at your location within two or four hours or the next business day (depending on service) after remote problem determination is complete. For 8x24-hour service, calls dispatched after 1:00 p.m. local time, you can expect the service technician to arrive by the morning of the next business day. For noncritical service request, a service technician will arrive by the end of the following business day, if the machine problem turns out to be a Customer Replaceable Unit (CRU). IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available at all locations. External peripherals, such as racks, tape drives and channel controllers, require their own, separate service coverage; they are not covered under the attached machine. Service activation is required immediately following purchase. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. For failing non-IBM components, customer must provide replacement part unless IBM has Technical Support Agreement with manufacturer. Service does not cover accessories, supply items and certain parts such as batteries, frames, and covers. ⁶Actual storage capacity will vary based upon many factors and may be less than 40GB. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. All IBM product names are registered trademarks or trademarks of International Business Machines Corporation in the U.S. and other countries. Lotus and SmartSuite are registered trademarks of Lotus Development Corporation, an IBM Company. Intel, Intel Inside, the Intel Inside logo, Celeron, Intel Centrino, the Intel Centrino logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. © 2003 IBM Corp. All rights reserved.

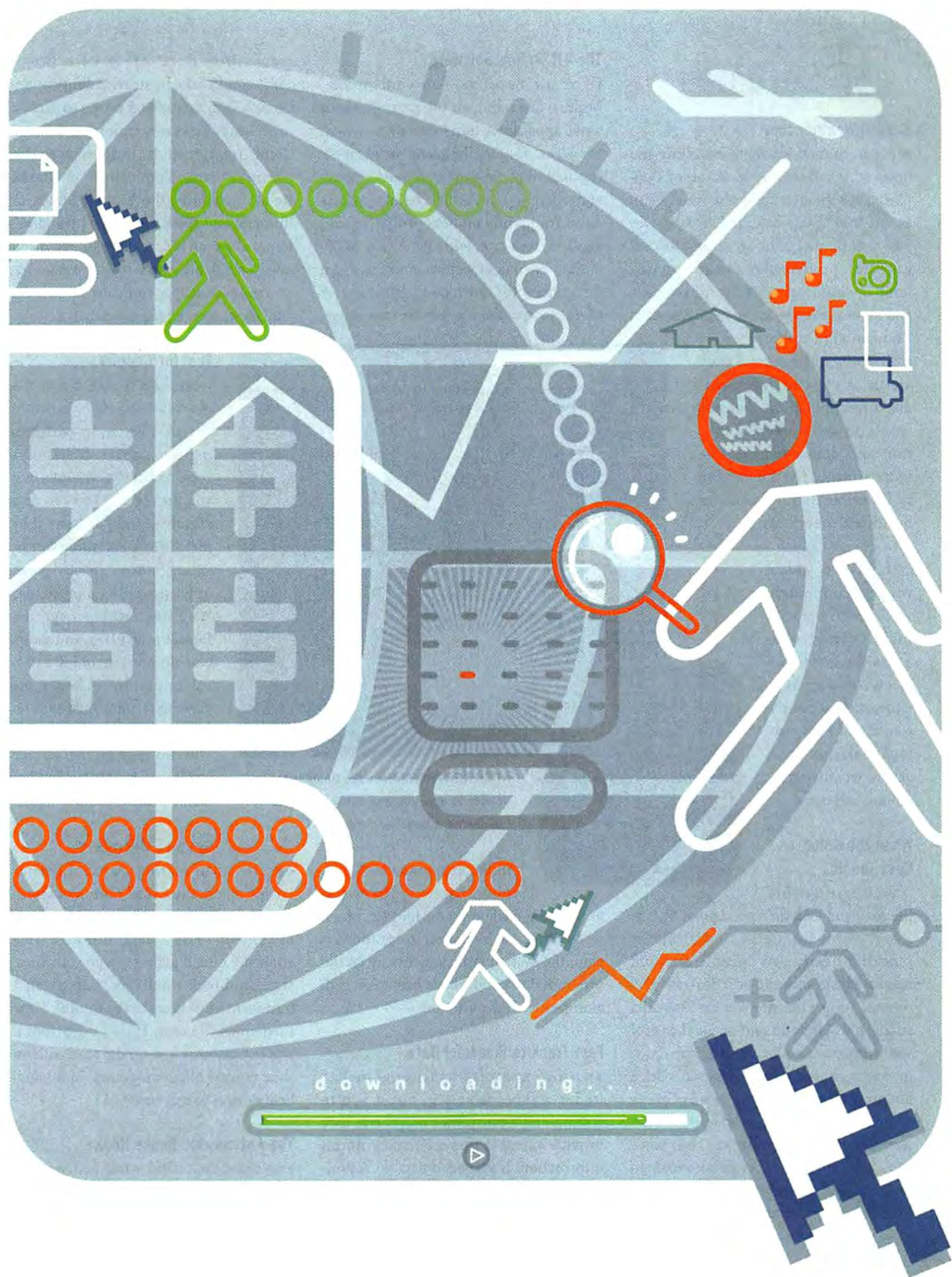
Our eighth annual extravaganza uncovers 101 essential sites, services, and tools you didn't know you couldn't live without. ▶

Best Free Stuff ON THE Web

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BY ROBERT LUHN • ILLUSTRATIONS BY CELIA JOHNSON



Tools and Services

Beyond Weather.com

FIND DETAILED weather forecasting and news at **AccuWeather.com**. A ton of Doppler radar images show the weather in action. Select your state, and the site gives you a static image or an animation for your area. AccuWeather can also provide hour-by-hour forecasts over three days and up to a year's worth of historical data.

You can sign up to receive e-mail weather updates and storm alerts, or you can download a desktop application that provides current weather information and displays a personal radar screen. Free (though limited) weather info is available for handheld users at pda.accuweather.com. PDAers with a wireless connection who cough up \$3 a month can receive a healthy subset of AccuWeather services, such as hourly forecasts, 15-day outlooks, warnings of severe weather conditions, and more.

When the Going Gets Tough...

...THE TOUGH hit the road and look for a good place to stay. **Travelaxe** (www.travelaxe.com) helps by scouring nearly two dozen travel and hotel Web sites for the best deal on hotel rooms. To use the site you first install a small app. Select the start and end days of your trip on a calendar, use the drop-down menus to choose your destination, click a button, and you'll get a screenful of offers you can compare side-by-side. Travelaxe won't book the room for you, but takes you to the appropriate reservation site to close the deal. At the time of this writing, Travelaxe tapped listings for 35,000 hotels in 535 different locations in 36 countries.

The 411 on New Software

IF YOUR PROFITS—or your mental health—are riding on the next release of a vital application, turn to **BetaNews** (www.betanews.com) for the scoop on when it's coming, what the prerelease version does, and where you can get it. The site updates news frequently on beta programs and services, freeware, and shareware. Many stories have beta tester comments and direct links for downloading the app. A useful companion site, **VersionTracker.com**,

porate firms from A to Z. **Carol** (www.carol.co.uk) takes a nearly identical approach but includes European firms. Searching, however, is more precise at Carol. You can sift by business type (for example, "Banks Commercial" or "Banks Retail"), region (the United States or Europe), and stock exchange. (And don't forget about an old, reliable source if you need a quick hit: A free search at **Hoovers.com** supplies snappy company summaries and, often, quarterly financials.)



Local Information
15-Day Forecast
Current Conditions
Get Details
Past 24 Hours
Past Year

ACCUWEATHER.COM uses Doppler radar images to give you a snapshot of up-to-the-moment weather data.

monitors thousands of shipping shareware, freeware, and commercial programs for PCs, Macs, and Palms. Each citation notes the version, the system requirements, what the program does, and what's been changed, along with a download link.

Fast Track to Financial Data

ANNUAL REPORTS usually get tucked under a short table leg, but if you're researching a competitor or a client, they provide valuable financial and cultural information. If you need data on American companies, turn to **Annual Report Service** (find.pcworld.com/35858), which provides links to annual reports on cor-

Tool for Googlers

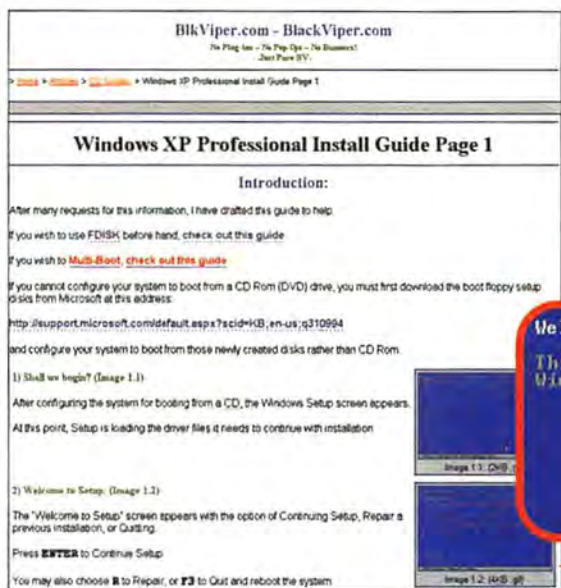
GOOGLE'S GREAT, but **Google Alert** (www.googlealert.com) makes it better, by performing automated searches on a regular basis and e-mailing you the results. You can do a simple search, or hone it by including or excluding words, sifting through updated pages only, searching a particular Web site, picking a specific format (say, PDF), and more. Google Alert includes a useful miniature browser for viewing results—just click on the link at the top of the e-mail message the service sends you. Note: Google Alert is not affiliated with Google.

Get an E-Secretary

ON THE RUN? Having a senior moment? Let the automatic e-mail reminders from **Time Cave** (www.timecave.com) give you or someone else a helpful nudge. Just enter the e-mail address, type your message, and pick a delivery time (from 1 minute to three years in the future). Time Cave does the rest. It's a handy tool if you're busy or you're on the road without your normal office programs (or a handheld device) to nag you.

The Antiquarian Booke Nooke

IF YOU CAN'T find what you want at Amazon.com, hie thee to **AddAll** (find.pcworld.com/35882), which searches used- and antiquarian-book dealers all



BLACK VIPER walks you through a Windows XP installation. The site shows you the series of screens you'll encounter (see page 92).

over the world. You can search by author, title, ISBN, binding, price range, and other attributes. The results page details each book's condition and vintage, as well as the store's contact information. More important, AddAll delivers results. When we searched for books by the 1920s humorist Robert Benchley, for example, AddAll ferreted out 480 titles, while Amazon.com found only about 25.

Digital Mulligan Stew

YOUR FRIDGE contains onions, lemons, and some pork; the pantry holds flour and baked beans. This is dinner? You bet.

Head over to **Cooking By Numbers** (www.cookingbynumbers.com), check off what you have from the site's list of 50 staples, and voilà—relevant recipes appear, rated 100 percent (if you have all the ingredients) or a lesser percentage (if you lack a few). While gourmet cooks may find the pickings slim, the site is perfect for the desperate parent or the forgets-to-shop bachelor. A great companion site: the **Cook's Thesaurus** (www.foodsubs.com), which has the scoop on any ingredient—how it's eaten and prepared, how to tell when it's no longer fresh, alternative names, and acceptable substitutes. ▶

TEACH YOURSELF

...To Build a PC

DUDE, you're gettin' a...bunch of parts, and you're going to build your own PC! The good news: Literally hundreds of sites are ready to show you how to turn that pile of electronics into a state-of-the-art computing machine. The bad news: Many of these sites are badly out-of-date, so watch out for old information. My favorite advice site is **MySuperpc.com**, which offers step-by-step instructions and is constantly updated with recommendations about specific parts and where to buy them. Other good guides of generally high quality and timeliness include **PC Mechanic** (www.pcmach.com/byopc), which offers a 27-step guide to getting the job done, but no pictures; **Buildpc.net**, which has a few videos; and **Waterwheel.com** (find.pcworld.com/35687), which displays tons of photos. For something a little off the beaten path, check out **Hardcoreware** (find.pcworld.com/35729), which takes you step-by-step through building a completely silent PC.

—Christopher Null



Best Add-Ons for Your Browser

Cool Flash Player Manager

www.siskinsoft.com

THE BEST Flash player and organizer around. It lets you snatch animations from your browser's cache, control playback (a browser won't), and capture frames. It can even convert Flash files into self-playing executable files. Free for 20 sessions, \$30 after that (IE and Netscape).

IP Search Toolbar

find.pcworld.com/35924

A HANDY, tiny app that provides many of the tools your browser lacks. From a small toolbar, you can fetch an IP address, run a Whois search, ping sites, sync your PC's clock to a reliable Internet source, and get details about an e-mail address. Fast and free (IE and Netscape).

Favorites to HTML

find.pcworld.com/35927

THIS TOOL allows you to share your IE favorites with others by turning IE's multi-folder clutter into one HTML file. You could also use the file as a start page. Free (IE).

Teleport Pro

find.pcworld.com/35930

SLOW OR PRICEY connection? Teleport can download part or all of a Web site for browsing offline. You can capture pages based on a word search or file type, and follow links off the site. Teleport is free, but to remove capacity limits, you need to register the product for \$40.

IDcide Privacy Companion

find.pcworld.com/35873

IDCIDE LETS YOU know if a Web site is tracking you and blocks the offending party. In addition, you can adjust the protection level to suit your preference (no protection, medium privacy, or high privacy). Unfortunately, IDcide currently does not work with IE 6; a version to support IE 6 is in beta. Free (IE).

Computer Help

Windows Secrets

WHEN WINDOWS CRAPS OUT, who you gonna call? We turn to **Brian's Buzz** (www.briansbuzz.com) by ace *Infoworld* columnist Brian Livingston. The site has Livingston's biweekly newsletter full of Windows tips (which you can get via e-mail) and, better yet, his Windows Tips Search

Engine, which scans over a dozen top-notch tech sites. An excellent partner in help is **Outlook & Exchange Solutions Center** (www.slipstick.com), which features how-tos, fixes, patches, utilities, and other assistance for people who rely on Microsoft's e-mail and messaging programs.

Geeks to the Rescue!

IF YOU DON'T MIND scrolling around a bit, check out **Black Viper** (blackviper.com) for Windows and Linux (Red Hat) instal-

lation guides, as well as general PC tips, buying advice, reviews, and PC-user postings identified simply as "rants." The site also provides help when you want to install more than one operating system. **AnandTech** (www.anandtech.com) and **Arstechnica.com** are helpful as well. AnandTech is chockablock with incredibly detailed reviews, analyses, and hardware news. Arstechnica features lots of primers ("Guide to Video Capturing"), buyers guides, and system tweaks.

STARTING POINTS

Five Easy Ways to Put Yourself on the Web

IF YOU'RE ONLY browsing the Web, you're missing out. In less time than it takes to make dinner, you can start a blog, make an event site, sell your attic clutter, write a review, or help a worthwhile charity.

Begin a Blog

THERE'S NO faster way to share your thoughts than with a Web log, or blog. These instant Web pages let you post text, images, and links in a jiffy. Start with **BlogSpot** (www.blogspot.com) and Blogger, its template-based blogging tool. BlogSpot will host your blog for free, if you don't mind a few ads alongside your prose, and if you can live without images, among other limitations. (For \$15 a year you can lose the ads.) You might be ready to compose and post from Blogger itself, but the program's text-editing functions are basic. Instead, use Notepad or another text editor to write and edit your message, then copy and paste the text into Blogger.

BlogSpot gives you the option of hosting your blog on your server, but users ready to manage their own blogs should check out **Radio UserLand** (radio.userland.com), a blogging system. It lets you try out the service free for 30 days (full price is \$40). Journalists will appreciate the News Aggregator built in to Radio UserLand, which lets you capture items from news sites and add them to a blog almost as soon as they appear. The system also makes it easy to

publish a Rich Site Summary stream for other blogs to pick up. For maximum control over your blog, including the ability to integrate files with your entries, try **Movable Type** (movabletype.org). Its server-based publishing system is free for personal use (\$150 for commercial use).

Event Sites in Minutes

THE NEXT TIME you're planning an event, why not create a Web site to provide information to invitees? Unlike sites such as **Evite** (evite.com), some services let you give your guests a single URL to check for updates, and they offer you more control over the appearance of the site. The Tripod service from **Terra Lycos** (tripod.lycos.com)

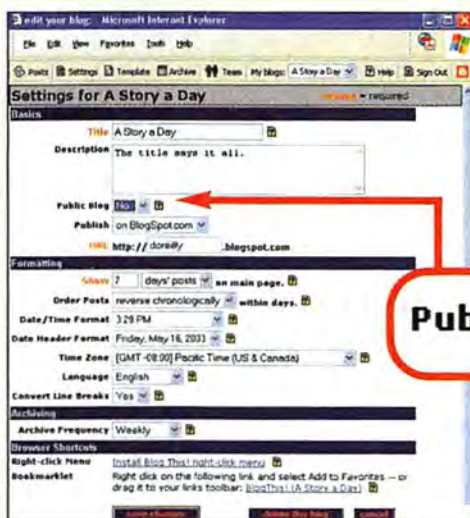
lets you post such a site for free, complete with a calendar and an e-mail link for invitees to use. When it's time to poll your guests about their food preferences, for instance, browse over to **CreateSurvey.com** to put together a free survey.

Where the Auction Is

JOIN SELLERS on such sites as EBay or Yahoo Auctions and get cash for your junk. Check out the sites' own advice on how to get started. Take EBay's audio tour at find.pcworld.com/35750, and visit find.pcworld.com/35753 for Yahoo's advice.

To help your auction attract lots of bids, make sure that you provide all the information prospective buyers expect. For example, buyers appreciate close-up photos, as well as detailed descriptions (take care to point out any flaws).

If you would like to know how many people viewed your auction listing, you might want to add a free traffic counter by



Public Blog

No

THE BLOG-BUILDING TOOL at Blogger.com lets you keep your blog private until you're sure you're ready for prime time.

Let's Get Small

WHEN IT COMES TO HANDHELDS, few nexuses are worth visiting. An exception is **Dave's PDA Place** (www.davespda.com), a full-featured site with reviews, generous FAQs on Palms and Pocket PCs, buying guides, and more. The site even lets you build tables to compare PDAs on the fly. **Brighthand.com** likewise covers both Palm and Pocket PC platforms, with news, forums, and interviews. Its tightly formatted reviews dig into audio, video, bat-

tery life, and wireless issues. For serious info on Pocket PCs, hit **CEWindows.NET**. The site has detailed FAQs that tackle an exhaustive number of topics. Feeling cheap? Put on your shades and check the scads of Pocket PC freeware at the gaudy but useful **CeBeans** (www.cebeans.com).

PC, Meet Mac

SOME CALL IT HERESY; we call it common sense. The Mac and PC gotta talk, and **Macwindows.com** delves into every ►



Andale (which is available at find.pcworld.com/36293). The Andale tracking feature works on auction pages at EBay, Yahoo, and Amazon.com. Go to find.pcworld.com/35810 and find.pcworld.com/35834 for more selling tips.

Give 'Em Your Two Cents

EVERYBODY'S got opinions about books, movies, PC products, and everything under the sun. One way to share yours is to write a user review. For electronics, books, music, movies, and more, you have a built-in audience at **Amazon.com**. Remember the writer's mantra: Keep the reader in mind! Don't skimp on specific details, especially if your

review is negative. If you are describing bands or singers, try to find other artists you can compare them to. And if you're reviewing a book or movie, *don't give the ending away!* Go to find.pcworld.com/35762 to see Amazon.com's guidelines for reviewers. And for a broader examination of user reviews along with a look at review sites, read "Public Opinions: Inside User Reviews" (find.pcworld.com/35054).

Get Involved

IF YOU'RE hankering to do your part to help your community, why not volunteer your time at non-

profit Web sites? Make **VolunteerMatch.org** your first stop. Click the *Virtual Volunteering* link, and you can get involved in all kinds of activities, such as newsletter writing. To find other sites that need volunteers online, check out the list of resources available at the **Coalescence** Web site (find.pcworld.com/35756). You could also volunteer your services at **WebJunction** (find.pcworld.com/35759), an organization devoted to technology and public access for libraries and other related groups.

—Dennis O'Reilly

Visit find.pcworld.com/36296 for blogging shareware and other Web authoring tools.

Five Great Privacy Sites

Privacy Rights Clearinghouse

www.privacyrights.org

A ONE-STOP destination for advice on all sorts of privacy issues, from identity theft to other privacy invasions. The no-nonsense Fact Sheets provide real-world help on combating workplace privacy violations, shopping safely online, and more.

Health Privacy Project

www.healthprivacy.org

WORRIED about who's looking at your health records—and what they're doing with the data? This watchdog group shows you how to protect your privacy, advocates for changes in laws and business practices, and issues reports that inform (and often sway) policy makers.

JunkBusters.com

www.junkbusters.com

DR. JASON CATLETT and his site are a thorn in the side of spammers, telemarketers, indifferent ISPs, and others who spread junk mail and invade your privacy. A superb resource that names names and supplies advice on stemming the flood.

Identity Theft Resource Center

www.idtheftcenter.org

IF YOU THINK your credit record is bad now, wait until someone steals your identity. The ITRC is there to help, with guides (how to prevent it, what to do if you're a victim), forms, shopping tips, and even tips on testifying in court. You get solid advice on protecting yourself and, if your identity is stolen, on cleaning up the mess.

Internet Privacy for Dummies

find.pcworld.com/35933

THIS SITE, tied to the book of the same name, has comprehensive news, as well as tips on stopping and complaining about spammers, protecting your kids, blocking Messenger spam, and more. Expect to see a few discreet plugs for the book.

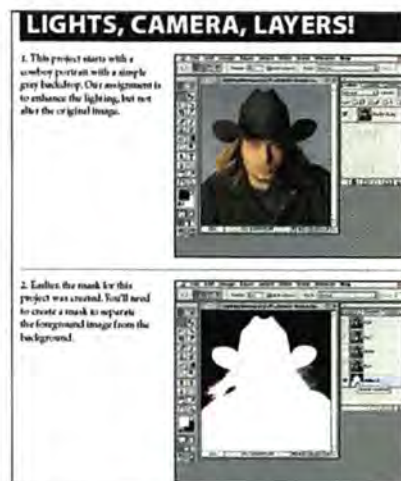
aspect of Mac and PC integration problems. You'll find solutions to connecting PCs and Macs on the same LAN, reading Mac floppies on a PC, sharing printers, and more, thanks to oodles of tips, tutorials, relevant news, and in-depth reports. The site is updated three times a week.

Top o' the Optical

WHEN IT COMES TO all things CD, Andy McFadden's **CD-Recordable FAQ** (www.cdrfaq.org) is the place to go. In addition to details on what different formats offer, the site tells you how to diagnose disc problems, how to take advantage of recordable features, and more. Be prepared: The site is basically one big hypertext page with lots and lots of links. It's well organized, however, and it offers nuts-and-bolts details to satisfy pros while remaining clear enough for newbies. For a terrific (and similar-looking) FAQ site covering all things DVD, seek out **DVD Demystified** (find.pcworld.com/35876).

Photoshop Help

BY HIS OWN ESTIMATION, **Russell Brown** (www.russellbrown.com) is one heck of a Photoshop guru. His puckish site offers lots of tutorials on basic to advanced Photoshop skills, from removing wrinkles to distorting text. Tutorials come as text



RUSSELL BROWN'S WEB site is devoted to Photoshop tricks. The example here is a tutorial on enhancing the lighting in the background of an image.

TEACH YOURSELF

...To Install Linux

YOU MAY NOT KNOW your *grep* from your *gruff*, but that doesn't mean you can't learn the commands to install Linux like a pro with a little help from the Web. The first stop for any novice should be **Linux Online** (find.pcworld.com/36215), which offers detailed tutorials for almost every Linux distribution plus additional tips on getting the OS to work. Another great resource—designed for experts but with plenty for newcomers too—is **The Linux Documentation Project** (www.tldp.org). Geeks help geeks by answering specific questions at **LinuxQuestions.org** and on Google Groups at comp.os.linux (find.pcworld.com/35732). Just visit the appropriate category (hardware, setup, security, and so on), and some kind soul will probably throw a little charity your way. —Christopher Null



documents, PDFs, and narrated QuickTime movies. **Computer-Darkroom** (www.computer-darkroom.com) is a good adjunct. It offers a ton of tutorials on manipulating images in Photoshop, scanning, and calibrating monitors, along with user reviews of products like photo printers.

Where's That Blog?

SOME PEOPLE might describe **Daypop.com** as the Google of blogs. It can search 35,000 blogs, news sites, and other feeds. It also lists the top 40 links showing up in blogs, the top blogs by citation and linking, and stats of all kinds. Type *Windows*, for example, in the search field, and you'll find a slew of links to great tech-related blogs. Or try **Technorati.com**, which finds out which blogs link to which sites—type in the URL, and you get a list.

Research and Advice

The Customer Zeitgeist

ARE CONSUMERS angry about service, or are they shifting to a new technology? Is DSL use up in Oregon? Answers to these and other questions can be found at **Nua** (www.nua.com/surveys), a handy site with surveys on just about any business area that intersects the Web, from automobiles ("One-third of United States-

based Internet users visited automobile sites in February 2003") to broadband usage ("Canada has a higher percentage of broadband Internet users than the U.S."). The site summarizes surveys from many firms. Everything is fairly current—just the ticket for a busy businessperson who needs marketing ammo on the go.

Find Someone

ONLINE PHONE DIRECTORIES come and go, and their accuracy can vary over time. As we went to press, two stood out: **Addresses.com** and AT&T's **AnyWho** (www.anywho.com). Both offer white and yellow pages, reverse and toll-free directories, and more. **Addresses.com** has useful extras (prefab phone books for airlines, hotels, and car rental agencies; e-mail address searches), as well as silly ones (celebrity e-mail addresses). **AnyWho** has a more logical interface, international yellow and white pages, and a more capable search engine for toll-free numbers.

For the Neurotic Traveler

WANT TO KNOW the safety record of a regional airline? Or how many crashes your favorite national carrier has had? For answers to these and other knee-knocking questions, head to the FAA's **Aviation Safety Data Analysis Center** (www.nasdaq.faa.gov). This Web site isn't for window-shoppers, nor is it easy to navigate. But if you want the real story, dig in. For exam-

ple, to get a list of accident reports, click the *Databases* link, select *NTSB Aviation Accident and Incident Data System (NTSB)*, and then choose *NTSB Data Query Tool*. In the form that opens, pick the factors you're interested in (such as 'Operator Name' or 'Injury Level'), and then click *Submit*. You might think twice about flying on some airlines.

Can You Trust the Web?

THE ANSWER IS OFTEN NO. **Consumer WebWatch** (www.consumerwebwatch.org) wants to change that. The site is a grant-funded project of Consumers Union, nonprofit publisher of *Consumer Reports*. You'll find in-depth reports evaluating Web commerce overall and by genre (such as online hotel booking), and lots of links to various groups committed to Web credibility, consumer protection and advocacy, privacy, and more.

The Other Drudge

THE MOTTO AT **RefDesk.com** is *Avaritia Facit Bardus*—greed makes you stupid. That's why RefDesk is free, says creator Bob Drudge (Matt's dad), and it's clearly a labor of love. The home page looks like an old Sears newspaper ad, but it's packed with links to useful resources. The emphasis is on, well, everything: news (and links to major sources); health, science, and technology stories; virus threats; over

a dozen reference sites; a grab bag of miscellany (Harper's Index, the Internet Health Guide); and more.

Fed by the Fed

FEDERAL WEB SITES CAN out-shovel anyone when it comes to free data, but they often lack interface niceties. Still, for certain kinds of statistics, there's no better place to poke around. **FedStats** (www.fedstats.gov) is a gateway to stats from federal agencies. Just pick a subject (Environment, say), and a list of relevant agencies, from EPA to NASA, pops up. Click the *Key Statistics* link to get quick hits on notable studies. You could also turn to the **Social Law Library's State Law Page** (find pcworld.com/35870) for a comprehensive and current list (organized by state) of links to state agencies, courts, and laws.

Scouting the Web

WEB NEWSLETTERS appeared minutes after the Web debuted. One of the first and best is **The Scout Report** (scout.wisc.edu), a weekly digest of useful sites with an academic bent. (Specialized spin-offs are devoted to physics, life sciences, and math/engineering/technology.) A typical 20-item report might reveal new figures from the Bureau of Labor Statistics, an archive on the free speech movement, a cool online collection of sheet music, and a special focus on a topic in the news. ►

TEACH YOURSELF

...To Speak Italian

PARLO UN PO' D'ITALIANO. That means "I speak a little Italian." And you'll certainly pick up a little Italian (and most other languages) on the Web, if you want to learn for free. None of the freebies will make you a master, but a few of them will at least get you started:

Fodors.com (www.fodors.com/language) has tons of travelers' translations (with audio) for common phrases, but no real instruction. **MyLanguageExchange.com** pairs up members in a sort of buddy system, each looking to learn the other's language. It's free, but it requires a partner with an equal level of motivation. **Italian.about.com** is another good resource, with essential phrases for travelers, an audio lab, and dozens of common Italian hand gestures explained. (No, polite ones.)

—Christopher Null



Got Broadband? Sites You'll Enjoy

IFilm

www.ifilm.com

BEYOND TRAILERS, IFilm dishes out meaty excerpts from all sorts of movies before they hit the theaters—including nearly 10 minutes of clips from blockbusters such as *The Matrix Reloaded* and *The Hulk*. You'll find lengthy excerpts from big, small, weird, and mature-content films, plus TV and music videos. Parental discretion advised.

TFN FanFilms

find.pcworld.com/35936

IF YOU LOVE *Star Wars*, belly up to this bar of parodies and homages, such as "The Vorzyd Gambit" and "Death Star Repairmen." Great silliness and surprisingly good filmmaking. The site is home to the classic parodies "Hardware Wars" and "Troops." Even if you're not a die-hard fan, you'll still enjoy the fun.

Musicmatch MX

www.musicmatch.com/mx

THE MUSICMATCH player is elegant and free. If you want to make the most of the player, pay \$3 to \$5 per month to listen to (but not save) all the music you want. The Musicmatch MX service gives you access to 500,000 tracks, and you'll also find some free MP3s and WMA tunes.

TVparty

www.tvparty.com

A GREAT LOOK BACK at TV's so-called golden era of the 1950s and 1960s. A ton of video excerpts from *Batman* to the Jolly Green Giant, and a ton of commentary and gossip, too.

All Day Breakfast

www.alldaybreakfast.ca

THIS SITE offers comedy gone digital—shorts, parody ads, and Swedish flicks. Click the *Recommendations* link for leads to dozens of other like-minded sites.

What Ails Ye?

SOMETIMES YOU NEED more medical advice than *Scrubs* can provide. The gold standard is **MedlinePlus** (find.pcworld.com/35861). Once the preserve of physicians, Medline's formidable database is now easier for laypersons to use and is open to everyone. You can easily search for a symptom, condition, or disease, and get quick links to studies, definitions, and the like. Other sections of the site provide direct access to news about clinical trials, a dictionary of strong drugs, and an illustrated medical encyclopedia. And unlike other medical sites, Medline doesn't pelt you with ads or other sponsored editorials. If you want heavy-duty medical information, go to find.pcworld.com/35864 for tools from the **United States National Library of Medicine** and the core Medline database.

Clarity on Charities

CONSIDER IT the *Consumer Reports* of the nonprofit world. **Charity Navigator** (www.charitynavigator.org) tells you where the money goes, how solvent the organization is, who runs it, and more. The site's star ratings provide a useful thumbnail guide to an organization's standing, and the site's various charts illustrate how an organization compares with its peers in the same field. Need more detail? **The**

National Center for Charitable Statistics (nccs.urban.org) stores copies of thousands of charities' IRS Form 990 (the nonprofit equivalent of a 1040).

True or False?

THREE SKEPTICAL Web sites allow you to double-check Internet rumors. **Truth-OrFiction.com** provides a list of out-and-out urban legends, disputed tales, and true stories, all searchable. A good backup is About's **Urban Legends and Folklore** site (urbanlegends.about.com). Concerned about medical hoaxes? **Quackwatch** (www.quackwatch.org) zeroes in on dentistry scams, health fraud, quackery, and homeopathy, to name just a few. You'll also find advice on how to pick a doctor, how to spot scams, and more.

TEACH YOURSELF

...To Create Origami

EVER ATTENDED an enormous cocktail party and found yourself so bored you were folding the napkins into, well, folded-up napkins? Turn your downtime into a creative endeavor by learning the ancient art of origami. Your first stop has to be **Origami.com**, which includes comprehensive how-to instructions for hundreds of classic and modern designs. **Origami Heaven** (origamiheaven.com) and **Paperfolding.com** are targeted at beginners and more-advanced levels; the truly lost should check out the animated Flash tutorials at find.pcworld.com/35678 to find their feet. —Christopher Null



YAHOO'S LAUNCHCAST lets you create a custom Web radio station all your own. Be prepared for some ads at start-up.

Household Care: Tiles and More

HOME IMPROVEMENT: personal hell or personal fulfillment? Either way, you need help. **Hometime.com**, a searchable how-to site built around the popular PBS and TLC Syndication show, covers all the bases, with lots of illustrations and real-world tips. (Cutting tile? "If you're using a utility knife, shorten the blade to keep it from breaking easily.") **Thetiledoctor.com** sports how-to slide shows, a lot of design help, and a nifty tile calculator (so you buy just the right amount of tile). For more-specialized assistance

and advice, seek out **Toiletology 101** (www.toiletology.com), a funny site with dozens of illustrated lessons on everything from toilet anatomy to septic tanks.

Arts and Entertainment

Tune In

WHEN IT COMES TO Web radio, ease of setup and number of tunes are paramount. For our money (none), the pick is Yahoo's **LaunchCast** (find.pcworld.com/35879). Personalizing your "station" takes a minute: Pick areas of interest and artists you like, click a button, and the hits start coming. You can also get lyrics and share the link to your station with someone else. You get few controls, however, and at start-up you must see ads. **BBC Radio Player** (www.bbc.co.uk) is a quirky companion. You can listen to BBC Radio programs covering all music genres, and better yet, local stations such as Radio Wales, along with the soap opera *The Archers* and intentionally funny (?) documentaries, such as "The History of Psychedelia."

All Music, All the Time

THE ULTIMATE MUSIC reference site for most genres is **All Music Guide** (www.allmusic.com). Search by artist, album, song, style, or label, and you receive ▶

Mobility. Taken to another level.



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ALLMUSIC IS THE uber music reference site. It tracks about a half million titles. Each album listing has a digestible summary.

detailed bios, discographies with user and AMG experts' ratings, and superior suggestions for similar artists to check out. When we examined the site, the listings covered 589,466 albums and 4,711,160 tunes. While the emphasis is on available albums, you'll find a lot of out-of-print titles, too. The user-run **MusicMoz** (www.musicmoz.org) is a good flip side. This discography-cum-metasearch site whips through billions of Web pages looking for info on your favorite artist. It also has a gangbusters Yahoo-like catalog with links to MP3 sites, musician resources, shopping sites, composer's tools, and more.

Veg Out

THE STANDARD REFERENCE for television programming is *The Complete Directory of Prime Time Network and Cable TV Shows*, but **TV Tome** (www.tvtome.com) comes pretty close. For each listed show you get summaries; air dates; episode lists with specifics; cast listings with links to bios; notable goofs; reader forums; and cross-links to related material. The site is hardly complete—at the time of this writing, it has 1400 guides available, with over 2700 new ones in development.

Art on the Internet

FORGET ALL THAT paint-and-canvas stuff. Thanks to the Web, interactive digital art is all the rage. And the **Whitney ArtPort** (artport.whitney.org) is your portal to electric, eclectic, and Webcentric art. The site has five areas: gates (entrée to artist Web sites), commissioned work (a

recent show: interactive art generated by code that could not exceed 8KB), exhibitions, collections, and links to other digital galleries, museums, and similar sites.

Primo Puzzles

HERE'S AN OLD wine in a new bottle—*The New York Times' Crossword Games* site (find.pcworld.com/35885). To

get new puzzles and multiplayer tricks, you gotta pay. But slide down to the Classic Puzzle link, and you can summon a challenging crossword from the paper's archives, updated weekly. Puzzle fanatics should check out Ray Hamel's **Crossword Puzzles** page (find.pcworld.com/35888). Hamel's site lists 250 puzzle sites, foreign language crosswords, solver sites, articles, software, and anagram generators.

Truly Weird Omnibus

FOR FANS OF TWISTED MUSIC, there's no better place than Otis Fodder's **365 Days Projects** (find.pcworld.com/35891), which features daily downloadable MP3s of the most baffling audio around, from corporate minimusicals that push photocopiers to Barbie-and-Ken duets. It's so addictive, you'll need a second hard drive

just to hold all the files you'll download. Good tagalongs: **Incorrect Music** (www.incorrectmusic.com) from WFMU radio, featuring "an asylum of crackpot and visionary music," and **Miserable Melodies** (find.pcworld.com/35894), where Travolta, Shatner, and others sing!

For boob toberie, we suggest **Modern Television** (www.moderntv.com), which distorts TV coverage (especially news) for comic and political effect. Some of the topics can be a little dated, though. For a frivolous diversion, try **The Oracle of Starbucks** (find.pcworld.com/35897) to get an analysis of your personality based on your beverage selection. Demented science fans should roam the **Annals of Improbable Research** (www.improbable.com), a site devoted to "genuine, and genuinely funny, research." Marvel at such (real) studies as "Feline Reactions to Bearded Men" and "Nano-Pasta—Thin Film Realization of Ultra-Fast Cooking Pasta Using Glancing Angle Deposition." Sign up for the newsletter and get the madness delivered to your in-box. ■

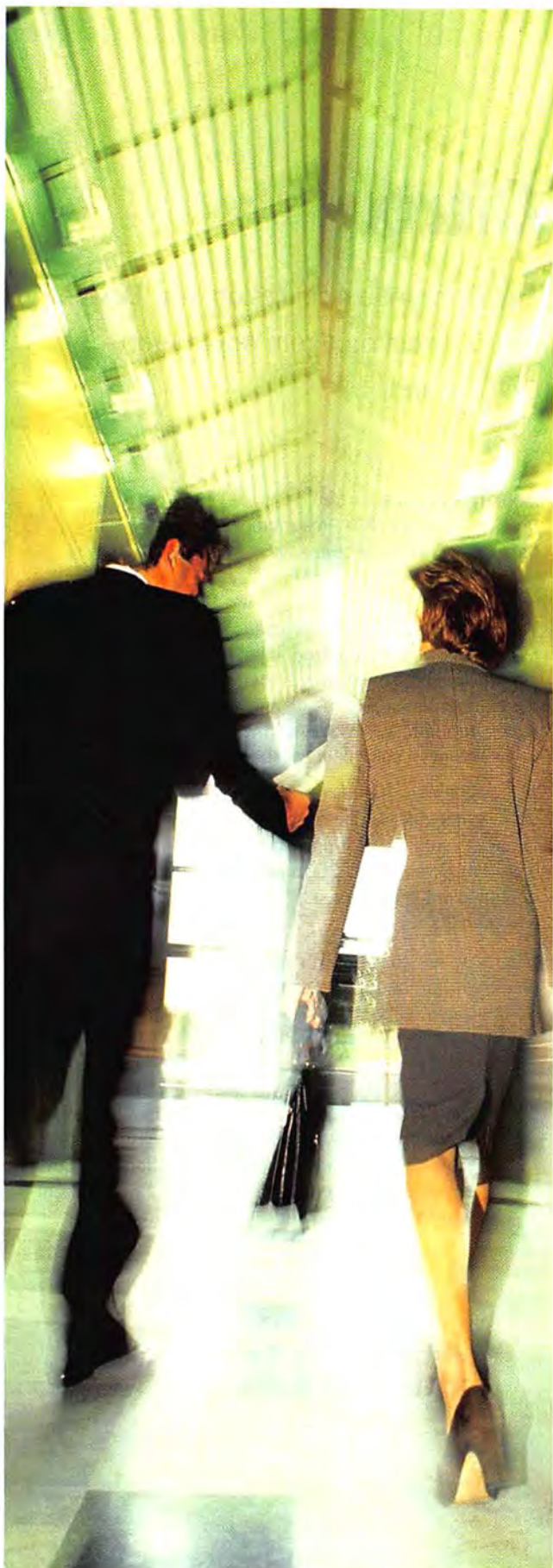
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...To Write a Business Plan

SICK OF WORKING FOR THE MAN? Get back at him by writing a business plan for your own start-up—say, while you're on company time! **The Small Business Administration** (find.pcworld.com/35693) makes a good first stop, with a comprehensive list of things to think about in putting together your plan. **Businessplans.org** has great example plans along with helpful advice, and **NASA** actually has a good outline (even for non-space-oriented businesses) at find.pcworld.com/35696. The free sample plan at **Bulletproofbizplans.com** is incredibly detailed and highly worth cribbing from. To download sample plans based on industry (manufacturer, retailer, and service provider), try the **CCH Business Owner's Toolkit** at find.pcworld.com/36326. —Christopher Null





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A man in a warehouse setting is using a handheld device. The background shows shelves filled with boxes and industrial lighting.

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Mega Storage To Go

There's a new removable storage option for every job, from key chain-size USB drives to humongous external hard disks.

We examine 15 portable, affordable contenders.

By Christopher Null

PHOTOGRAPH BY JOHN KUCZALA

STORAGE IS LIKE MONEY: You can never have too much. And you need different denominations for different situations.

When picking a storage device, you'll want to balance several factors, including capacity, portability, and cost. Which one you choose will depend on how you intend to use your storage. For example, you may want to transport files on a flash memory drive that you can put in your pocket and ►



attach to any computer that has a USB port. Perhaps you want to burn data to cheap discs that most CD or DVD drives can read. Or maybe you want to transfer gigabytes of files to a hard drive.

To address these different storage situations, we separated the products in this review into three categories: "Put It in Your Pocket," "Make Multiple Copies," and "Really Pack It Away." After all, you wouldn't rely on a comparatively slow optical or cartridge drive with removable media to back up your entire hard disk—not when the external hard drives we tested were far faster and could complete the task in one step. And you wouldn't reach

for a hard drive if you had a pocket-size flash memory drive to tote your presentation from desktop to laptop.

We tested 15 products in the PC World Test Center; our Best Buy picks in each category—SanDisk's pocket-size Cruzer, Sony's DRU-510A DVD burner, and Maxtor's Personal Storage 5000DV external hard drive—offered the best mix we could find of capacity, portability, and price.

One factor behind the recent expansion in storage options is widespread support for USB 2.0 on new desktop and notebook PCs. At 480 megabits (60 megabytes) per second, USB 2.0 is fast enough that it doesn't slow down external drive

performance, as USB 1.1 does. And since neither USB 2.0 nor the less common FireWire 400 requires you to install drivers or special software, connecting drives using these interfaces is painless, and the drives will work almost instantly under Windows Millennium Edition, 2000, or XP. The same is true of the new FireWire 800 interface, also known as IEEE 1394b, which doubles the maximum speed to 800 mbps (100 MBps). (For more information on FireWire 800 performance, see "FireWire 800: Fast Not Furious," on page 36.) In light of the convenience of these fast interfaces, it's no wonder that external drives are becoming so popular.

Storage Your Way

THERE'S PRACTICALLY a different device for every storage need. Depending on the task at hand, you may want a small, pocket-size drive like the SanDisk Cruzer, a removable-media drive like the Sony DRU-510A DVD burner, or an external hard drive like Maxtor's Personal Storage 5000DV. We've identified five common tasks and picked the best bet for each.





BEST BUY:
SanDisk Cruzer



Kanguru Solutions
KanguruMicro Drive+



Lexar Media
JumpDrive Trio



M-Systems DiskOnKey
Classic 2.0



TrekStor USA
ThumbDrive 2 Smart

Put It in Your Pocket

Best Buy SanDisk Cruzer

THE CRUZER we tested came bundled with a 256MB Secure Digital card (other capacities are available), and offered the best deal for the money in this category. Plus, the drive can grow with you via additional SD cards.

EASILY THE MOST convenient way to transport files from place to place, featherweight, key chain-size devices come in capacities as large as 2GB in solid-state (no moving parts) memory systems that are not much bigger than one or two packs of gum. Most are reasonably sturdy and effortless to use—just plug them in, wait a few seconds for a driver to load, and they're ready to take your files.

These pocketable drives are most appropriate if your capacity requirements top

out at 512MB. They can hold important documents, hundreds of digital photos, or hours of MP3s. If you need more space, though, these devices get prohibitively expensive: Prices for the models we looked at range from a modest \$80 for a 128MB drive to \$165 for a 256MB unit; but a key chain-size 2GB flash memory drive costs \$1300, more than four times the cost of a 512MB model. That high cost alone is reason enough not to spring for a 2GB device—which you could lose as easily as you might misplace your keys.

Three products we tested, from Kanguru Solutions, M-Systems, and TrekStor USA, use on-board flash memory. But the other two models we evaluated rely solely on removable flash media cards: Our Best Buy, the SanDisk Cruzer, handles Multi-

MediaCard and Secure Digital, and the Lexar Media JumpDrive Trio supports Memory Stick, MMC, and SD.

Removable flash media has several advantages. You can share the cards with a compatible digital camera or PDA, and you can easily supplement your capacity with new cards as needed, at about half what you'd pay for an additional, solid-state memory drive of comparable capacity. On the other hand, you have to take care not to misplace the tiny media cards.

The Cruzer, priced at \$85 and equipped with a 256MB SD card, is one of the best values in this roundup despite being slightly larger than the other devices we tested. (It measures about 0.75 inch across, so it may not fit in the space allotted for USB ports on some desktop ▶

FEATURES COMPARISON

HANDY POCKET-SIZE DRIVES

NOT ALL FLASH MEDIA DRIVES are created equal, as our read and write performance tests—led by M-Systems' drive—showed.

PRODUCT	Street price	Tested capacity	Interface	Removable media	Time (in min-sec) required to		Comments
					Write 120MB	Read 120MB	
Kanguru Solutions KanguruMicro Drive+ find.pcworld.com/36038	\$130	256MB ¹	USB 1.1	MultiMediaCard, Secure Digital	4:04	2:13	Svelte device offers on-board storage and an SD card reader for infinite expansion. (★★★★☆)
Lexar Media JumpDrive Trio find.pcworld.com/36035	\$80	128MB ²	USB 2.0	Memory Stick, MultiMediaCard, Secure Digital	5:39	1:42	Awkward flap makes loading media tricky; device includes lengthy USB extension cable. (★★★☆☆)
M-Systems DiskOnKey Classic 2.0 find.pcworld.com/36032	\$165	256MB ¹	USB 2.0	n/a	0:50	0:31	Model's CPU makes it superfast; partitioning and password software is a plus. (★★★★☆)
Best Buy SanDisk Cruzer find.pcworld.com/36029	\$85	256MB ¹	USB 1.1	MultiMediaCard, Secure Digital	3:38	2:11	Amazing value; however, this drive is slightly bulkier than the others. (★★★★☆)
TrekStor USA ThumbDrive 2 Smart find.pcworld.com/36026	\$100	128MB ¹	USB 2.0 ⁴	n/a	5:29	1:32	Smallest pocket drive around has partitioning and password software, but is slow. (★★★☆☆)

n/a = Not applicable. ¹ Flash memory. ² Memory Stick. ³ Secure Digital. ⁴ Vendor says product is incapable of transfers faster than USB 1.1 rates.

systems, in which case you'll have to use the included USB 1.1 extension cable to connect the drive to your PC.) Unlike other devices, which cover their USB connectors with an easy-to-misplace cap, the Cruzer has a nifty retractable connector.

Although Lexar Media's JumpDrive Trio (\$80 with a 128MB Memory Stick, \$20 without memory) has a more tapered form than the SanDisk Cruzer and supports three media types, we liked it the least of the five products we tested. For one, you have to open a flimsy, poorly designed flap to insert your media into the JumpDrive Trio, and then close the flap behind the card. Furthermore, the device was the slowest writer we tested, though it finished third in reading among the models in its category.

Kanguru Solutions' KanguruMicro Drive+ (\$130) sports an SD slot in addition to its 256MB of integrated memory. With an SD card inserted, the Kanguru displays two logical drives within Windows, one for the built-in memory and one for the card. This USB 1.1 device was about 12 percent slower than the Cruzer at writing our 120MB test file, though, and it was slowest at reading that same file.

LAB NOTES

File Transfers With a Twist

TEST Center

WE TESTED THE read and write capabilities of drives in this review by using Windows XP Professional's Explorer to transfer a folder of files to the device, and then to copy that folder back to our hard drive. For the "Put It in Your Pocket" category, we used 120MB of files; for "Make Multiple Copies," 500MB (and rewritable media); and for "Really Pack It Away," 10GB.

The results in each category reflect performance across a range of drive and media types for the tested file sample. Throughput per megabyte will vary, though, depending on such factors as the amount and size of the files you're writing; the area of access on the hard drive, or on the DVD or CD media; and the speed rating of the CD or DVD media.

The dedicated flash memory drives we evaluated—M-Systems' DiskOnKey Classic 2.0 and TrekStor USA's ThumbDrive 2 Smart—have a few things in common. Both devices are bootable (if your BIOS supports booting from a USB device), and both offer free software that lets you add password-protected, resizable partitions.

The DiskOnKey (\$165 with 256MB of storage space) uses an on-board ARM7 CPU to accelerate transfers impressively: It took less than one-fourth as long as its closest competitor, the Cruzer, to complete our write test, and about one-third as long as the next-fastest drive, the Thumb-

Drive 2, to speed through our read test.

By contrast, the tiny ThumbDrive 2 Smart (\$100 for 128MB) took six and a half times longer than the DiskOnKey to complete our write tests. Despite being billed as a USB 2.0 device, the model we tested is merely a USB 1.1 drive that works—as all USB 1.1 devices do—under USB 2.0 at standard 1.1 speed. By early fall, TrekStor USA plans to release an updated ThumbDrive with enhanced electronics that should boost performance. TrekStor sells this ThumbDrive model directly; Memorex markets the same ThumbDrive as a USB 1.1 drive.

Storage Tools to Keep Your Data Organized

DUPLICATE FILES, mounds of unlabeled media, and the pressing question of which disk has what archive: Do these common scenarios sound familiar? We offer some tips to help you through the herculean labor of organizing your data.

Label it: Never mind using a permanent marker; kits from Imation, Maxell, Memorex, and others let you design custom labels and print to disc-size templates; they also include an optical-disc label applicator. Avery (www.avery.com) even makes tiny labels for flash media and various media types, and offers free, downloadable Word templates that work with them. Or print your label directly on certain CDs or DVDs with Epson's Stylus Photo 900 ink jet printer.

Open the Briefcase: Microsoft's Briefcase (built in to Windows) can be useful for keeping duplicate data on your primary PC and on a device such as a laptop or an external hard drive. Files updated at either location are replicated to the other device whenever you choose to synchronize files by clicking the Update All button. To give it a try, open the storage device in Windows XP's Explorer and select **New>Briefcase**, and then follow the wizard.

Organize it all: Windows' Indexing may facilitate searching your hard disk; but inexpensive utilities such as Argentum's MyFiles (www.argentuma.com), Elcomsoft's Advanced Disk Catalog (www.elcomsoft.com), and 1Vision Software's 1Disk (www.1disk.com) can index and organize your files across removable media as well. These apps can tell you on what disc you'll find a long-lost MP3—but it's still up to you to clean out the garage.

Get a device that does more: Do you really need to cart 30GB of music around on your Apple iPod? There's no reason your ears can't spare a little space for your brain. Have your music player cede a few gigabytes of storage space to share with your PC. Some hard-drive audio players, such as the iPod and Creative's Nomad Jukebox Zen, can store data; likewise, some USB flash memory drives, such as the CenDyne Grävstick, can play MP3 files. Later this year we'll see models that incorporate digital cameras, too.



MP3s and data in one: CenDyne's Grävstick.



BEST BUY:
Sony DRU-510A



Addonics Pocket
DVD-R/RW



Iomega Zip 750



LG Super-Multi DVD-
Writer GMA 4020B



Plextor PlexWriter
Premium

Make Multiple Copies

Best BUY SONY DRU-510A

THE FIRST dual-format DVD burner to support 4X DVD+RW, this drive was blazingly fast compared with the other models in this category; it includes backup software, too. But finding 4X DVD+RW media on store shelves may be difficult.

THE FIVE DRIVES—from Addonics, Iomega, LG Electronics, Plextor, and Sony—that we evaluated in this category are a mixture of internal and external models that rely on removable media. This type of storage can be a tremendous advantage for such tasks as transporting large files and making copies of your data to share or archive as needed. An added benefit: The media for these drives is relatively inexpensive (except for Iomega's Zip 750 disks, which cost up to \$15 each).

To test each drive in this category, we

used the appropriate rewritable media—CD-RW, DVD-RW, DVD+RW, DVD-RAM, or Zip 750—and dragged and dropped a 500MB folder of files in Windows Explorer. For each of the four optical drives, we first installed the included packet-writing software to permit such drag-and-drop file transfers.

The capacity of rewritable DVD gives it a clear edge in this category (see find.pcworld.com/35720 for our most recent *Top 10 DVD Drives* chart). Our Best Buy is the \$330 Sony DRU-510A, a speedy internal drive that supports DVD-RW and DVD+RW (and their corresponding -R and +R write-once formats). Using 4X DVD+RW media, it handily outpaced the competition, and was almost three times as fast as the next best drive, the Plextor, on our write tests. Its terrific software bundle includes ArcSoft ShowBiz, Sonic

MyDVD, and Veritas Simple Backup.

Though Sony makes an external version of the DRU-510A, Addonics' \$440 Pocket DVD-R/RW is smaller and more portable. This slim-line USB 2.0 drive relies on a notebook DVD burner, which writes DVD-RW discs at 1X—far slower than most internal drives. The unit took 6 minutes, 17 seconds to write 500MB (compared with 1 minute, 56 seconds for the Sony), but it was still faster (by over a minute) than LG's \$220 Super-Multi DVD-Writer GMA 4020B. We tested the multiformat LG using 2X DVD-RAM media; its write performance was the slowest among the drives in this category.

CD media remains the most widely compatible, which is why dedicated CD burners continue to thrive. Basic drives average about \$70 (head to find.pcworld.com/35159 for our most recent *Top 10* ▶

FEATURES COMPARISON

FLEXIBLE REMOVABLE MEDIA DRIVES

THESE FIVE DRIVES CAN handle a variety of tasks, but Sony's DVD burner was easily the fastest.

PRODUCT	Street price	Tested capacity	Interface	Removable media ¹	Time (in min:sec) required to		Comments
					Write 500MB	Read 500MB	
Addonics Pocket DVD-R/RW find.pcworld.com/36041	\$440	1X 4.7GB DVD-RW	USB 2.0	DVD-R/RW, CD-R/RW	6:17	3:10	Tiny portable burns DVDs anywhere, but you pay a high price for that convenience. (★★★★☆)
Iomega Zip 750 find.pcworld.com/30815	\$180	750MB Zip	USB 2.0	750MB, 250MB Zip	6:06	2:04	Sturdy cartridges are compatible only with other Zip 750 drives; includes practical backup software. (★★★★☆)
LG Super-Multi DVD-Writer GMA 4020B find.pcworld.com/31067	\$220	2X 4.7GB DVD-RAM	IDE	DVD-R/RW, DVD-RAM, CD-R/RW	7:19	3:09	DVD-RAM is best for archiving data and is good for video recording, but its write speeds are slow. (★★★★☆)
Plextor PlexWriter Premium find.pcworld.com/36044	\$120	24X 650MB CD-RW ²	IDE	CD-R/RW	5:42	2:24	Password-protected discs and the potential for 32X CD-RW set this drive apart from other CD burners. (★★★★☆)
Best BUY Sony DRU-510A find.pcworld.com/35495	\$330	4X 4.7GB DVD+RW	IDE	DVD-R/RW, DVD+R/RW, CD-R/RW	1:56	1:44	Optical storage at its fastest, if you can find the media; multiformat drive supports 4X DVD+R/RW. (★★★★☆)

¹ Write-once and rewritable formats.

² Supports 32X CD-RW with firmware upgrade.

CD-RW Drives chart), but Plextor's \$120 PlexWriter Premium adds a few interesting features. For one, Plextor says the drive will soon support 32X CD-RW via a firmware upgrade (we tested the drive with 24X media). It also includes the inellegant PlexTools applet, which lets you cram 1GB of data onto a 700MB CD-R and password-protect the disc. The Plex-

Writer took nearly three times as long as the Sony DVD drive to write our 500MB folder of files; still, at just about a third of the cost of the Sony, it's a strong value.

The lone nonoptical drive in this category, Iomega's \$180 Zip 750, offers a durable, cartridge-based alternative. This USB 2.0 drive has a slick-looking design, includes useful Iomega backup utilities,

and proved surprisingly quick in our tests, trailing the PlexWriter Premium by only 7 percent. The drive can read from 100MB cartridges, and it can read from and write (rather slowly) to 250MB cartridges. However, unlike CDs, you can share Zip 750 disks only with other Zip 750 drive users, since the media is not backward compatible with older Zip drives.



BEST BUY: Maxtor Personal Storage 5000DV



LaCie D2 U&I Hard Drive



SmartDisk FireLite



Storix Fusion 40GB HDD



WiebeTech UltraGB-120HS

Really Pack It Away

Best BUY Maxtor Personal Storage 5000DV

WITH THE PRESS of a button, this external hard drive can jump-start your backups. The 160GB Personal Storage 5000DV has USB 2.0 and FireWire 400 interfaces—making it a great choice to share among systems.

FLASH MEMORY is optimal for quick, small file transfers, and optical storage is ideal for midsize tasks. But if you need to back up a hard drive or transport really large files, an external hard drive is your best option for the job.

The \$300 SmartDisk FireLite Portable FireWire Hard Drive and the \$260 Storix Fusion 40GB HDD are lightweight and will fit in your hand. Other models, such as the \$340 LaCie D2 U&I Hard Drive, are about the size of a hardcover novel. Regardless of their physical size, the five units we scrutinized are simply internal hard drives in a fancy shell. And although those shells usually contain some sort of shock protection, one jarring drop could spell doom for your data. Still, if handled with proper care, these drives are great for

backing up gigabytes of files: Two units we looked at—from Maxtor and Storix—even include Dantz's Retrospect Express software to facilitate backups.

For tasks that require high-end performance, you'll want a model that contains a faster, higher-capacity, 3.5-inch desktop drive—such as the LaCie, the Maxtor Personal Storage 5000DV (our Best Buy), or the WiebeTech UltraGB-120HS.

Pocket-size external hard disks typically use 2.5-inch notebook drives, as the SmartDisk and Storix models do. Accordingly, these drives have a lower capacity (topping out at 60GB) and run at a slower rate (measured in revolutions per minute) than their desktop siblings. Our test results reflect this: The Storix trailed the leader in this category, the LaCie, by about 40 percent in our write test; the SmartDisk trailed the LaCie by about 65 percent, making it the slowest drive at writing data. The smaller drives cost more, too: For example, the svelte, dual-interface Storix costs only \$40 less than the Maxtor, but the latter has four times the capacity.

Maxtor's \$300 5000DV comes prefor-

matted, and supports both FireWire 400 and USB 2.0. A solid performer (it ranked second on our write test), its greatest asset is its one-step approach to backup: Simply push a button on the front bezel of the drive to launch the included backup utility. Getting Retrospect Express running properly takes a bit of fiddling; but once you've fine-tuned it, the 5000DV is terrific for backups or everyday storage needs.

LaCie's D2 U&I is a big 200GB drive; it was the heaviest external model we reviewed. Though the D2 supports FireWire 800 and was easily the fastest drive in this category, we didn't see a dramatic performance boost in our tests between FireWire 400 and 800—the drive was just 35 seconds (5 percent) faster on our write test using FireWire 800. The minor performance difference is attributable to the fact that current hard drives can't feed data through the FireWire 800 interface swiftly enough to produce a significant improvement. The drive comes unformatted, and installation is awkward: Windows 98 users must install an included third-party application; XP and 2000 ►

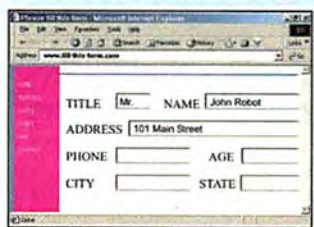


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Manual LOGIN to an average online account takes remembering password, pressing 20 keys, moving mouse 3 times.

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FEATURES COMPARISON

ROOMY EXTERNAL HARD DRIVES

AMONG THESE FIVE HARD DRIVES, the FireWire 800-based LaCie D2 had the performance edge—but not by much.

PRODUCT	Street price	Tested capacity	Interface	Drive speed (rpm)	Time (in min:sec) required to		Comments
					Write 10GB	Read 10GB	
LaCie D2 U&I Hard Drive find.pcworld.com/36060	\$340	200GB	FireWire 800, ¹ USB 2.0	7200	11:53	8:18	The speediest—and heaviest—drive we tested, but it had the hardest installation. (★★★★☆)
Best Buy Maxtor Personal Storage 5000DV find.pcworld.com/36056	\$300	160GB	FireWire 400, USB 2.0 ¹	7200	13:06	12:26	Button launches backup software, making this a great choice for hassle-free full backups. (★★★★☆)
SmartDisk FireLite Portable FireWire Hard Drive find.pcworld.com/36053	\$300	60GB	FireWire 400	4200	19:48	9:44	Supremely portable drive, but it can't handle more than one interface. (★★★★☆)
Storix Fusion 40GB HDD find.pcworld.com/36050	\$260	40GB	FireWire 400, USB 2.0 ¹	4200	16:33	13:10	With its backup software and slim design, this drive is an attractive companion on the road. (★★★★☆)
WiebeTech UltraGB-120HS find.pcworld.com/36047	\$330	120GB	FireWire 400, ¹ USB 2.0	7200	13:37	9:07	Reasonably quick drive can get power via FireWire bus, but weak documentation is a shortcoming. (★★★☆☆)

¹ Tested interface.

users are directed to the arcana of the Administrative Tools control panel.

The \$330 WiebeTech UltraGB-120HS requires similar hoop-jumping to configure. We obtained mixed results when trying to format the 120GB disk: One drive we tested worked flawlessly the first time

through, while another required three tries. The inadequate manual was of little help in resolving our issues. However, depending upon your PC's configuration, the drive can run from the system's bus power when connected to the FireWire 400 port, eliminating the need for a power

adapter. Though this feature is common with lower-power 2.5-inch drives such as the Storix and SmartDisk, it is unusual with 3.5-inch models. ■

Christopher Null is a freelance journalist and technology consultant in San Francisco.

Tomorrow's Storage

IF YOU FEEL undersupplied with storage capacity, just wait: Greater capacities—in various shapes and sizes—are on the horizon.

Blue-laser DVD: In the next year, blue-laser DVD technology will boost the capacity of a single-sided DVD from 4.7GB (using a red laser) to double-digit gigabytes. But get ready for another format war, as well: Two competing consortia are working on incompatible blue-laser standards.

Pioneer, Samsung, Sharp, Sony, and other parties are promoting "Blu-ray" technology, which will write up to 27GB per disc and will target high-end video applications for recording 2 hours of high-definition television on a disc. NEC and Toshiba, which jointly announced a blue-laser technology dubbed Advanced Optical Disc, lead the other consortium. This group claims that AOD media will hold up to 36GB of data and will be able to read and write existing red-laser DVDs.

If you want blue-laser DVD, you may have to wait a while: The first stand-alone Blu-ray DVD recorder, from Sony, is available only in Japan, and it costs about \$4000; blue-laser DVD drives from other makers are due in the United States in the first half of 2004.

Hard drives: One anticipated application of Serial ATA is in the pending IVDR standard. This spec defines a removable-cartridge format for hard drives, so users will be able to tote removable cartridges from their PC to their home theater to their car audio system as they would a DVD or CD. Products aren't expected until 2004.

Meanwhile, users will be able to share Ximeta's NetDisk, due later this summer, via a 10/100 Base-T ethernet network. The portable hard drive appears as a local drive to all of the computers on the network, but it doesn't require the overhead of users' having to configure the drive on a server.

Miniature media: In the fall, Hitachi plans to upgrade the capacity of the Microdrive (originally developed by IBM, and almost as small as a CompactFlash card) from 1GB to 4GB. Hitachi says that

the new Microdrives should be priced lower than a comparably sized CF card (which will cost \$1000), and will find a home in high-end digital photography and digital video recording. However, CF cards will continue to drop in price and gain capacity. Flash media vendors expect CompactFlash to hit 8GB by the end of 2004. Secure Digital cards will reach 1GB by the end of 2003.



HITACHI'S Microdrive.

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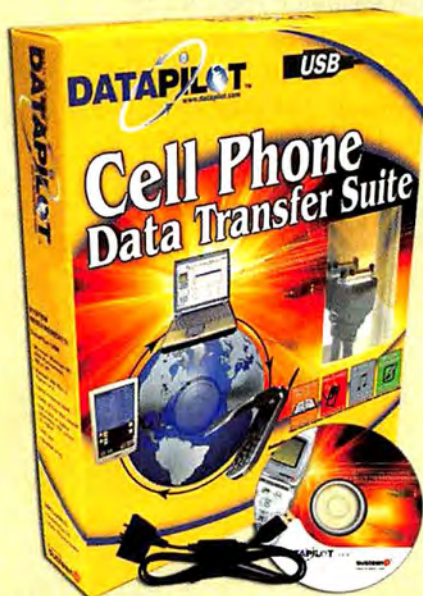
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Manager



Internet Data
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SMS
Manager*



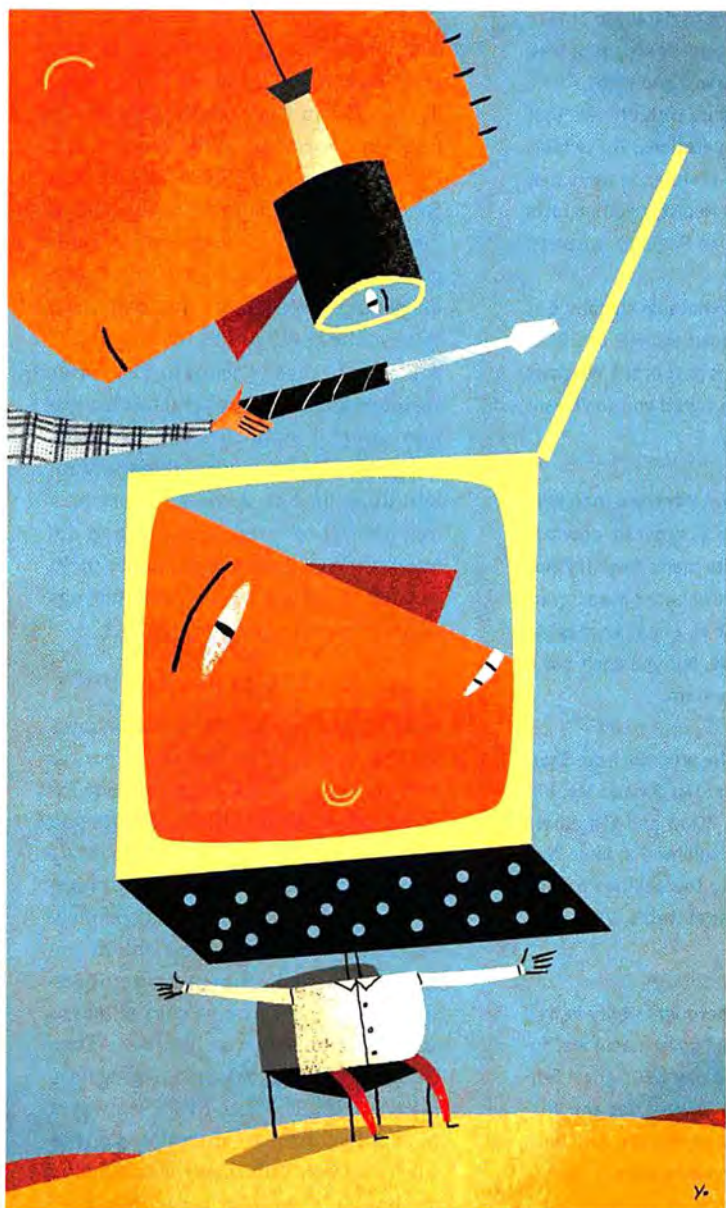
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Pain-Free Windows Tweaks



Want to fix nagging Windows irritations and automate everyday tasks? With these surprisingly simple Registry and batch-file tips, it's not brain surgery.

EVERYBODY'S GOT THEIR OWN Windows pet peeve, whether it's the operating system's habit of shifting your desktop icons around or its proclivity for putting all the wrong files in your Recent Documents folder. While you can fix many Windows woes by changing a single setting, every now and then you encounter a problem or limitation that you can alleviate only by journeying into Windows' brain—the Registry—to adjust the resident gray matter.

Our 15 Registry tweaks and tools let you hide drive letters in Windows Explorer, lock Internet Explorer toolbars, and make other changes, some with the OS's tools, and some with a free Registry helper. And for a more nimble Windows, try our five downloadable batch files. ►

BY SCOTT DUNN

ILLUSTRATIONS BY JAMES YANG

PROCEED WITH CAUTION

THE WINDOWS REGISTRY is an arcane repository of an immense number of system and application settings. Make the wrong change, and you might not be able to start Windows again. The Registry is not a playground for creative experimentation. Begin by taking some precautions (back up!), and remember that any system

change has the potential to be calamitous.

Go to find.pcworld.com/35789 for Stan Miastkowski's step-by-step instructions for backing up the Registry. If you make a boo-boo, visit find.pcworld.com/35792 for Lincoln Spector's advice on restoring the Registry to an earlier state.

In addition to adopting Stan's global approach, back up the portion of the Registry you plan to change, just before you

make the alteration: Choose *Start>Run* (or press **<Windows>+R**), type **regedit**, and press **<Enter>**. Once you're in the Registry Editor, navigate down the tree diagram of keys (Registry-speak for folders) on the left until you reach the section you plan to edit. It's usually best to dig all the way down to the deepest level you intend to alter. That way, you back up the minimum amount of data necessary, which keeps the backup file small and—if you later decide to undo your change—prevents you from overwriting unrelated settings that may have changed.

With the desired icon selected on the left side, choose *Registry>Export Registry File* (*File>Export* in Windows XP). In Windows XP, you can back up the file by right-clicking its icon in the left pane and choosing *Export* (see **FIGURE 1**). Make sure *Selected branch* is checked at the bottom of the Export Registry File dialog box. Navigate to a folder where you can safely store the settings; type a name and click *Save*. Now you're ready to edit the settings. If you need to restore them to their prior state, locate the Registry (.reg) file that you just exported, right-click it, and choose *Merge*. Click *Yes* to confirm that you want to restore the data. Although merging a .reg file will restore any changed or deleted settings on the exported branch, beware: It will not remove new settings added after you exported the branch.

FREEZE YOUR EXPLORER VIEW

EVERY TIME YOU log off, Windows saves the size and position of the taskbar, as well as the size and location of your Explorer windows (for the next time you open them). But you might want to set up your taskbar and folder window arrangement once and have Windows open that way in the future, regardless of how you futz with them during your current session. To do that, arrange your windows and taskbar the way you like them. Then launch the Registry Editor and navigate to `HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer`. With *Explorer* selected in the left pane, look for the icon labeled

TOOLS OF THE REGISTRY TRADE



DOES IT SEEM a little odd (not to mention cumbersome and risky) that you must dig through an enormous database of Windows settings, manually adding and editing geeky strings of text, just to make your system look and act the way you wish? Fortunately, a number of fine folks have come up with utilities that convert common Registry edits into simple point-and-click operations. These tools let you customize the appearance and behavior of Windows features in ways that would otherwise necessitate a manual Registry change. Some Registry-editing tools cost up to \$40, but why pay anything? Here are our favorite free Registry tweakers.



Tweak UI: This is Microsoft's venerable standby. Get version 1.33 if you use Windows 9x, Me, or 2000.

The version of Tweak UI for XP is part of the Windows XP Power Toys package (but you don't have to install the other toys if you don't want them). Go to find.pcworld.com/35813 to download your copy.



Fresh UI: Sporting a much more elegant interface than Windows Explorer, Fresh Devices' Fresh UI program provides overview information on each of its many Registry tips and clearly indicates which settings will work in each version of Windows. You have to submit an e-mail address to get this product and its registration code, but you don't pay a

cent. Browse to find.pcworld.com/35816 to download the program.



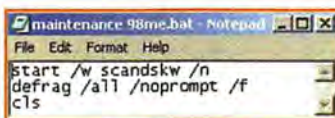
Windows Configurator: This wonderful little program from Skorzynski Leszek was designed for Windows 9x and Me, but many of its controls work in Windows 2000 and XP; others may not, and still others require Internet Explorer 4 or later. Windows Configurator offers many security functions, including the abilities to hide Startup items, limit network access, and lock Control Panel items. Visit find.pcworld.com/35819 to download the freebie.



X-Setup: Xteq's Xtra-geeky (but Xtra-thorough) utility is free to home users, libraries, charities, and government institutions. Businesses must register and pay \$200 for a ten-user license. The program has both Power User and Wizards modes. Its Safe Mode explains every Registry change and lets you turn back before it applies one. Go to find.pcworld.com/35822 to download a copy.

Automate Hard-Drive Maintenance

BATCH FILES TRACE their lineage back to DOS, but they're still handy for everyday Windows chores. This one scans your hard drive for errors and then defrags it automatically. If you have the appropriate apps, you can make it scan for viruses, back up data, and perform other chores. Go to find.pcworld.com/36168 to



download the file and instructions for Windows 98 and Me, find.pcworld.com/36161 for Windows 2000, and find.pcworld.com/36167 for XP. The Windows 2000 version requires that you download and install MorphaSys's free AutoDefrag program (find.pcworld.com/35843) before you use it. —Lincoln Spector

NoSaveSettings on the right. (Not there? No problem. Just right-click in the right pane and choose **New > DWORD Value**. Type **NoSaveSettings** to name it, and press **<Enter>**.) When you're done, double-click your **NoSaveSettings** icon to edit its setting. In the 'Value data' box, type **1** and press **<Enter>**. You may have to log off and log back on again before the setting will take effect. Thereafter, each time you log on and open Explorer or any folder window, it and the taskbar will return to the size and position you froze them in, even if you rearranged or resized them during your previous Windows session.

HIDE A DRIVE

IF YOU WANT to discourage others who log in to your Windows profile from using a particular drive, you can shroud it in a cloak of invisibility so that it won't show up in Explorer. The drive will remain accessible, however: Global searches will continue to examine its contents, some third-party file managers may still see it, and Microsoft Office apps will find it with no problem. But hiding the drive's letter in Windows Explorer may keep other users from hosing the drive by mistake.

To cloak a drive, open the Registry ▶

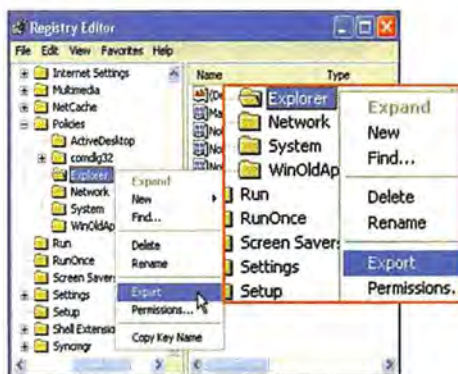


FIGURE 1: BACK UP JUST THE KEYS you intend to change, by exporting the lowest possible branch in the Registry Editor.

REGISTRY KEYS

INSIDE THE MIND OF WINDOWS

SELECTING A KEY in the Registry Editor's left tree pane displays its contents on the right, just as in Windows Explorer or any folder window. But Registry keys do not represent folders stored on your machine. Rather, they identify collections of settings. With all icons collapsed, you see the major Registry sections: (1) **HKEY_CLASSES_ROOT** is where the Registry stores all file type, file association, and icon information. All settings or preferences specific to the profile you are logged in to reside in (2) **HKEY_CURRENT_USER**. This data is also in (3) **HKEY_USERS**, along with the same settings for all other profiles. As you might

guess, (4) **HKEY_LOCAL_MACHINE** contains hardware and related driver settings. The hardware configuration currently in use is in (5) **HKEY_CURRENT_CONFIG**.

Though careless changes to any of these sections can cause problems, **HKEY_CURRENT_USER** is the safest to work in. If you make a mistake in this part of the Registry and Windows starts behaving bizarrely, you can get around the problem by creating a new user profile and logging in to that one instead. You'll lose all your preferences and settings, of course, but at least you won't have to remember which part of **HKEY_CURRENT_USER** you messed up.



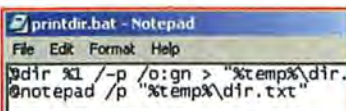
THE REGISTRY'S five major sections (shown below with some of their subkeys) hold all of Windows' system settings.



BATCH FILE

Print a Folder's Contents

WINDOWS OFFERS NO easy way to print a list of the files in a given folder, but this batch file does. Go to find.pcworld.com/36170 to download the file `printdir.bat`, and save it in the `SendTo` folder under your user profile. To find your `SendTo` folder in Windows 98, Me, or XP, select *Start•Run*, type `sendto`, and press **<Enter>**. If you use Windows 2000, go to find.pcworld.com/35846 for details on how to proceed. Once the file is in your `SendTo` folder, you can print a copy of a folder's contents by right-clicking the folder's name in Windows Explorer and selecting *Send To•printdir.bat*.



—Lincoln Spector

Editor and navigate down to `HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer`. Look for an icon labeled `NoDrives` in the

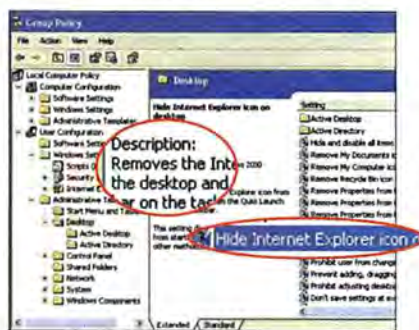


FIGURE 2: THE GROUP POLICY TOOL lets you configure Windows to the nth degree without requiring risky Registry editing.

right pane. If you don't see such an icon, right-click anywhere in the right pane, choose the *New•DWORD Value* option, type `NoDrives`, and press **<Enter>** to name it. Double-click the `NoDrives` icon, and in the *Edit DWORD Value* dialog box, select *Decimal*. In the 'Value data' box, type a value that corresponds to the drive you want to hide—for A: 1; B: 2; C: 4; D: 8; E: 16; F: 32; G: 64; H: 128; I: 256; J: 512; and so on. To hide multiple drives, add up the relevant numbers and type that sum in the 'Value data' box. For example, if you want to hide drives E: and F:, you would determine $16 + 32$ and type the sum, **48**, in the 'Value data' box. To hide all drives, type **67108863**. When you're done, click **OK**. You'll have to log off and then log back on to see the effect.

TWO TONY TWEAKING TOOLS

WINDOWS' REGISTRY Editor isn't the only way—nor is it always the best way—to edit the Registry, depending on the task. Many other Windows tools customize system settings without your having to edit the Registry directly. They may be designed for IT types, but they're accessible enough for mere mortals to wield as well.

One of these tools is System Policy Editor. To install it in Windows 98, insert your Windows CD-ROM into the drive and search for the file named `poledit.exe`, which should be in the `tools\reskit\netadmin\poledit` folder. Click *Start•Settings•Control Panel*, double-click *Add/Remove Programs*, select the *Windows Setup* tab, and click *Have Disk*. Navigate to the proper folder on the disc, select `poledit.inf`, and click **OK** twice. Check the *System Policy*

Editor box, and click *Install*. If you don't find it on your Windows CD-ROM, go to Microsoft's Windows 95 Update page at find.pcworld.com/35795 and search for System Policy Editor.

Once you've installed the program, launch it by choosing *Start•Programs•Accessories•System Tools•System Policy Editor* or by clicking *Start•Run*, typing `poledit`, and pressing **<Enter>**. The first time you run System Policy Editor, it may prompt you to open a template. If so, locate and select the `Admin.adm` file to satisfy the program. Then choose *File•Open Registry* and double-click an icon (either *Local Computer* or *Local User*) to pick the portion of the Registry you want to edit. After changing a setting, choose *File•Save* or click the *Save* icon on the toolbar.

Windows Me doesn't include System Policy Editor, and Microsoft won't support its use in that version of the OS. Many of the controls will still work in Windows Me, but there's no guarantee.

For users of Windows 2000 and Windows XP Pro (sorry, Homies), the Group Policy utility provides point-and-click ways to customize Windows (in effect, you're editing the Registry). To launch Group Policy in these versions of Windows, choose *Start•Run*, type `gpedit.msc`, and press **<Enter>**. In the left tree pane, navigate to *User Configuration\Administrative Templates* for the most common customizing options (see **FIGURE 2**).

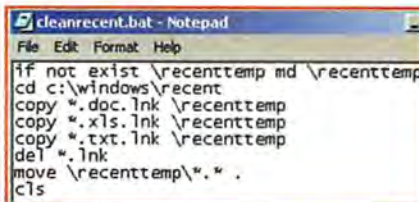
BATCH FILE

Purge Your Recent Documents

YOU WANT TO return to the spreadsheet you were working on yesterday, so you go to the Start menu's Documents list (Recent Documents in Windows XP). Unfortunately, Recent Documents gives every file type equal weight, including the types you don't return to often. This batch file culls everything from Recent Documents that lacks one of the extensions you specify beforehand, such as `.doc`, `.xls`, and `.txt` (as in the example here). This

file doesn't remove the documents, only the shortcuts to them. Visit find.pcworld.com/36173 to download the batch file and instructions for using it.

—Lincoln Spector



Though less functional than the Registry Editor, both the System Policy Editor and Group Policy let you tailor many Windows properties. For example, each tool allows you to restrict access to selected Control Panel icons, among other features (go to find.pcworld.com/35798 for more on this capability). In Windows 2000 and XP Pro, you can use Group Policy to remove built-in items from the Start menu (visit find.pcworld.com/35801 for instructions). Note that while both these tools can be used for many of the tips described here, not every version of Windows has them, so we present only the old-fashioned Registry Editor approach.

The System Policy Editor and Group Policy reduce many Registry settings to simple point-and-click controls. As a result, careless experimentation can lock you out of your own account or cause other serious damage. Don't ignore our advice to back up your Registry beforehand. And make sure that you check out "Tools of the Registry Trade" on page 114 for the lowdown on some of our favorite third-party Registry editors.



FIGURE 3: GET EVERY USER'S ATTENTION by posting a notice that pops up whenever Windows starts to load.

WARN ON BOOT-UP

MAYBE YOU SET UP computers in a public venue and want a disclaimer to appear each time Windows starts. Or you might want the employees of your company to read a legal notice before beginning each workday (see **FIGURE 3**). Perhaps you just want to give your kids some important instructions when they get home from school and boot up. You can make such a message appear in a dialog box before the Windows welcome or boot screen so that everybody who uses the machine will see it. All users will have to click OK in the message box before continuing.

Open the Registry Editor. In Windows

BATCH FILE

Launch Multiple Programs

SOME CHORES REQUIRE you to open more than one program. This batch file lets you launch several programs at once. In Windows 98 or Me, each line of the batch file should contain the command to launch a particular program or file, as in `c:\quicken\qw.exe` or `"c:\my documents\finances.xls"` (the quotes are required because of the space in the file path). End the batch file with the command `cls` on the very last line. In Windows XP or 2000 (shown here), your batch file must point to file shortcuts rather than to the files themselves.

It's best to collect the shortcuts you need in one folder.

Because you'll have to make this batch file yourself, there's nothing to download. Simply open Notepad or the text editor you prefer and type in the command lines shown, altered to point to the applications you need to open.

—Lincoln Spector



9x and Me, navigate the left pane down to `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Winlogon`. In Windows 2000 and XP, go to `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon`. If you don't see an icon labeled `LegalNoticeCaption`, right-click anywhere in the pane, choose `New>String Value`, type `LegalNoticeCaption`, and press **<Enter>**. Create a String Value icon named `LegalNoticeText`, if it doesn't already exist in the Winlogon key.

Double-click `LegalNoticeCaption`. In the 'Value data' box, type the text you want to appear in the message's title bar (you can leave this blank if you prefer), and press **<Enter>**. Next, double-click `LegalNoticeText`, type your message in the 'Value data' box, and press **<Enter>**. The warning dialog box accommodates a pretty large paragraph; if you plan to input more than a couple of sentences, you should probably compose the message in Notepad or another text editor, double-check it, and then paste it into the 'Value data' box in the Edit String dialog box. To remove the message later, simply return to this setting and delete any text you added for `LegalNoticeCaption`, `LegalNoticeText`, or both.

LOCK THAT TASKBAR

XP IS THE FIRST version of Windows that lets you lock the taskbar so you can't move it inadvertently. (Right-click the taskbar and choose *Lock the Taskbar* to activate the feature.) To add this capability to Windows Me, position and size the taskbar to your liking, then open the Registry Editor, navigate the left pane to `HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced`, and look for an icon in the right pane named `TaskbarSizeMove`. If it's not there, right-click in the right pane, choose `New>DWORD Value`, type `TaskbarSizeMove`, and press **<Enter>**. Double-click the icon and set 'Value data' to **0** to immobilize the taskbar.

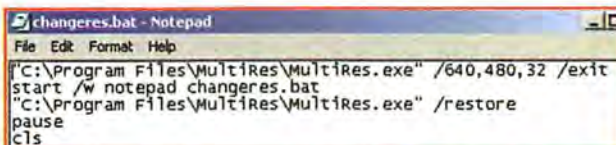
The next time you log on, you won't be able to move or resize the taskbar, but you can add and remove toolbars by right-clicking the taskbar and choosing options from the Toolbars submenu. You can also resize and rearrange individual toolbars. If you want to resize the taskbar or drag it from one screen edge to another, you can change the `TaskbarSizeMove` Registry setting: Return to the Registry branch above, double-click `TaskbarSizeMove`, and change the 'Value data' setting to **1**. Click OK, log off, and log back on to make your taskbar movable once again.

BATCH FILE

Change Your Resolution on the Fly

SOME PROGRAMS work best at a particular screen resolution. This batch file changes your resolution to 640 by 480 (at 32-bit color depth), launch-

es a program, and waits until you exit before returning to your original settings. It requires EnTech Taiwan's free MultiRes, so download and install that program from find.pcworld.com/35849 before loading the batch file. The file loads in Notepad, but just change



```

" C:\Program Files\MultiRes\MultiRes.exe" /640,480,32 /exit
start /w notepad changeres.bat
"C:\Program Files\MultiRes\MultiRes.exe" /restore
pause
cls

```

the second line to tell the file to load itself into the program of your choice. Alter the numbers on the first line to change the resolution and the color

depth. The terms "start /w" at the beginning of the second line and "cls" at the end of the program are necessary in Windows 98 and Me; they're harmless in 2000 and XP. Visit find.pcworld.com/36176 to download the batch file. —Lincoln Spector

LOCK THOSE TOOLBARS

WINDOWS 2000 and XP let you freeze the position of your toolbars in Windows Explorer and Internet Explorer (right-click a toolbar and choose *Lock the Toolbars* to activate this feature). You can still add or remove individual toolbars and customize the Standard Buttons toolbar, but there's a way to increase your toolbar options in any version of Windows simply by adding a couple of settings to your Registry.

In the Registry Editor, navigate in the left pane to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer, and select this key. If the right pane doesn't contain an icon labeled *NoBandCustomize*, right-click in the right pane, choose *New•DWORD Value*, type *NoBandCustomize*, and press **<Enter>**. Double-click *NoBandCustomize*, type *1* in the 'Value data' box, and press **<Enter>**. You may need to log off and then log back on again before the setting will take effect. Now the toolbars in Explorer, IE, and your folder windows will be locked, and you can activate or deactivate them only by editing the Registry. This also removes the 'Lock the Toolbars' command in Windows 2000 and XP.

If you want to prevent anyone from customizing the Standard Buttons toolbar, right-click in the right pane of the same Registry entry, choose *New•DWORD Value*, and enter *NoToolbarCustomize*. Set this key's 'Value data' to *1*. The next time you log on—and thereafter—the *Customize* command won't appear when you

right-click or choose *View•Toolbars* in Windows versions that support this feature (see **FIGURE 4**). Some changes will still be possible, however. For example, anyone will still be able to toggle text labels for the Standard Buttons toolbar



FIGURE 4: USERS CAN'T ADD or remove toolbars or customize the standard buttons when you lock them in place via the Registry.

(right-click and choose *Text Labels*), or (more unfortunately) to drag icons on, off, or around your Links toolbar.

CAP YOUR FILE NAMES

WHEN YOU NAME a folder with eight characters or fewer, Windows 98 changes any all-caps typing to initial capital only. If you want some folder names to have all capital letters for emphasis, open the Registry Editor and go to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced. With the *Advanced* key selected in the left pane, double-click the *DontPrettyPath* icon in the right pane. Change the 'Value data' setting from *0* to *1* and press **<Enter>**. Folder names entered with all capital letters will thenceforth appear as you typed them, as will eight-character file names (and old DOS files) created with all caps.

PUT OUTLOOK IN YOUR TRAY

IF YOUR PC RUNS Microsoft Office XP and you like to keep Outlook open but minimized most of the time, you may not want the program to take up space on the taskbar when you aren't actually using it. A reader who signed his e-mail only as David points out that a simple Registry edit lets you make Microsoft Outlook appear as an icon in the taskbar tray (the area near the clock), instead of as a taskbar button, when minimized.

Begin by opening the Registry Editor and navigating to HKEY_CURRENT_USER\Software\Microsoft\Office\10.0\Outlook\Preferences. With *Preferences* selected in the left pane, right-click anywhere in the right pane and choose *New•DWORD Value*. Type *MinToTray* and press **<Enter>** to give your new icon a name. Now double-click the *MinToTray* icon, enter *1* in the 'Value data' field, and press **<Enter>**. If Outlook is running, exit and then restart it. The next time you minimize Outlook, it will disappear from the taskbar and appear as a tray icon. Simply double-click the tray icon to restore it. The Outlook icon appears in both the taskbar and the tray when the application window is open (not minimized), but when you minimize the program, the icon vanishes from the taskbar. ■

Scott Dunn writes the monthly Windows Tips column, and Lincoln Spector writes the Answer Line column. Both are contributing editors for PC World.

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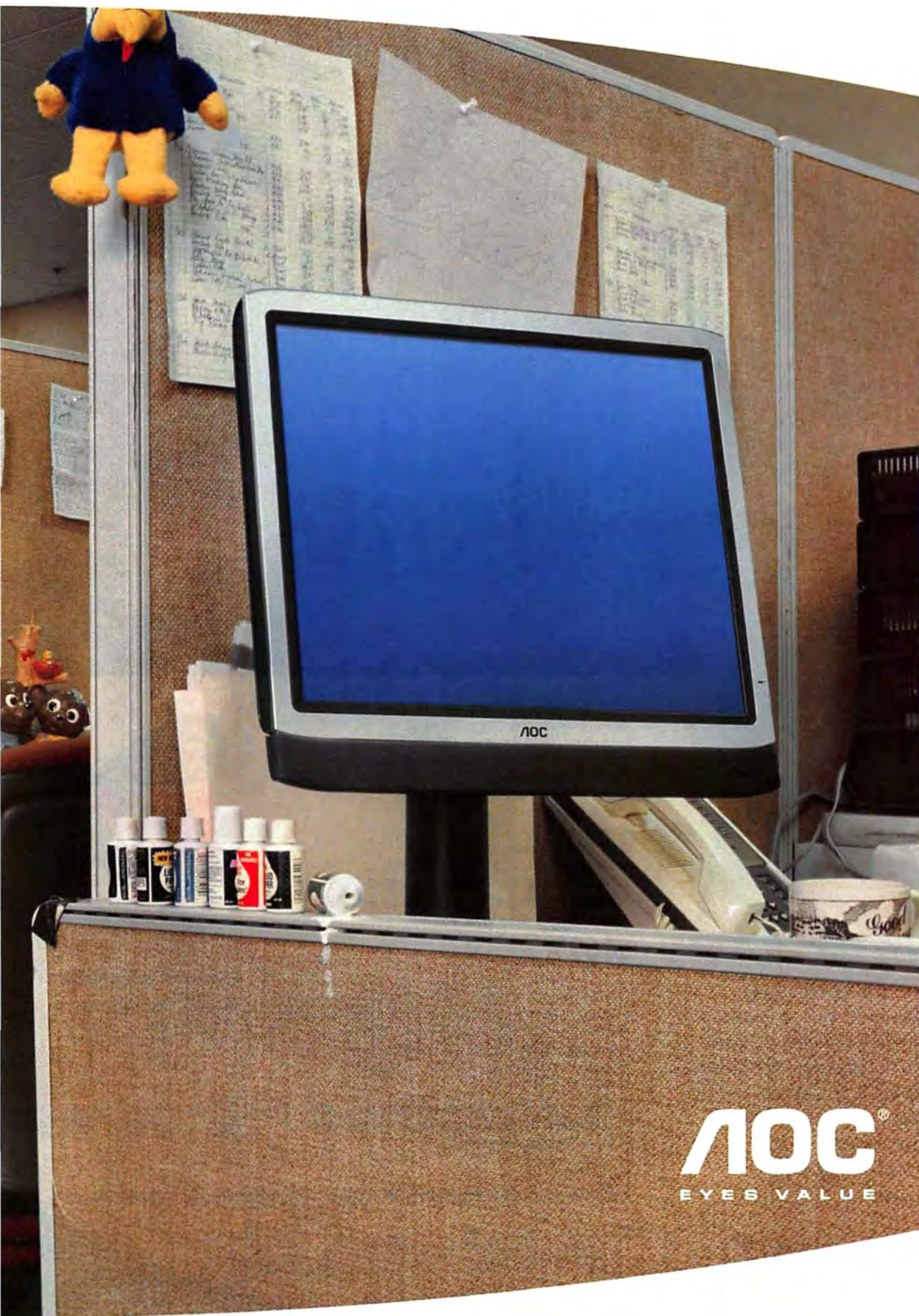
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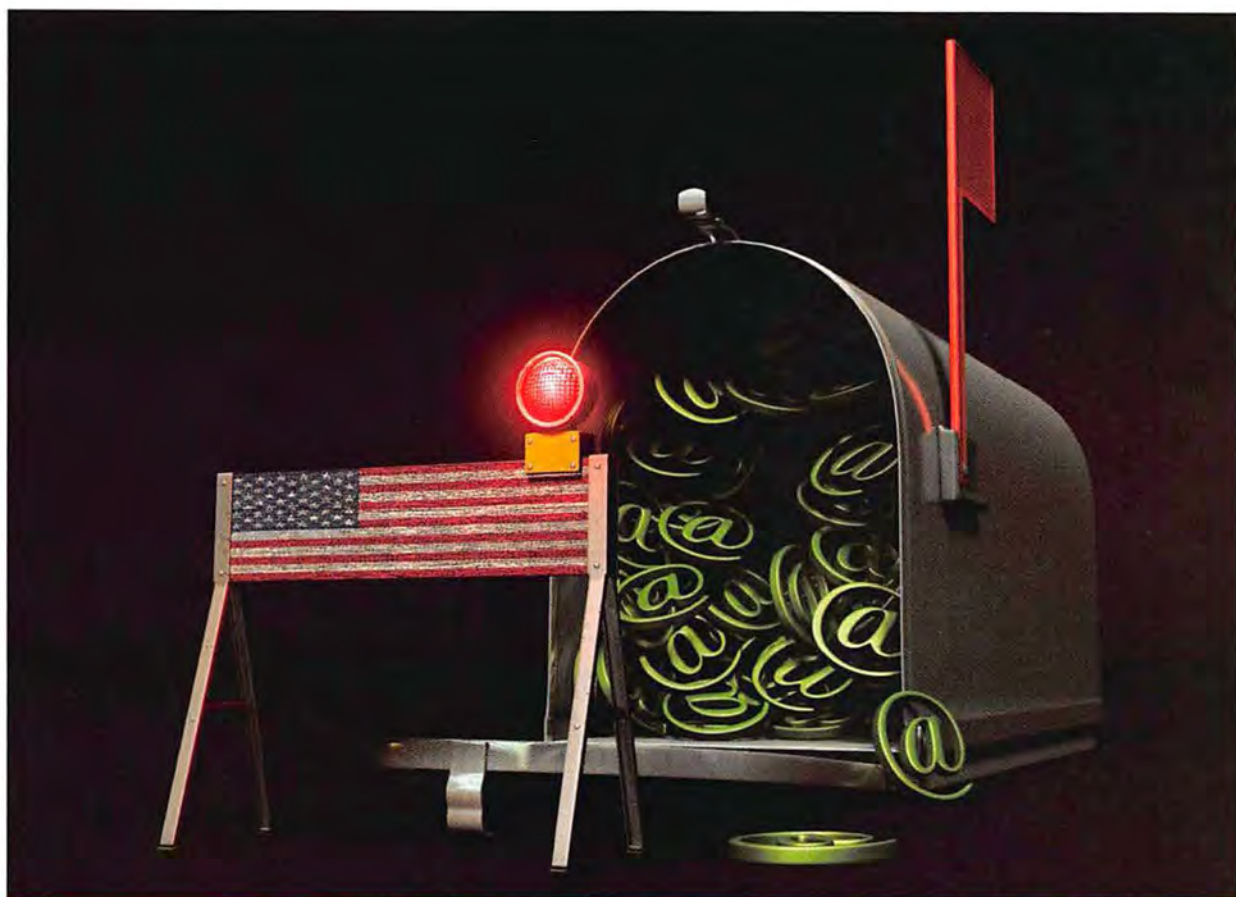
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Empowering People



UNCLE SAM VS. SPAM

A slew of proposed federal and state bills promise to protect your in-box. But can any law stem the tide of spam?

BY DANIEL TYNAN | ILLUSTRATIONS BY JOE ZEFF



IN VIRGINIA, it's a felony to send out bulk e-mail with forged return-address information. Spammers who use misleading subject lines can be sued for \$500 per infraction in Washington state. Fourteen ►

states require e-mail advertisements to carry the label ADV in the subject line, and Delaware bans *all* forms of unsolicited commercial e-mail. But anyone with an in-box knows that none of these laws—nor any of the 15 other state antispam statutes now on the books—has stopped unwanted bulk e-mail.

According to the e-mail security vendor MessageLabs, the volume of spam has now surpassed the quantity of legitimate e-mail arriving in people's in-boxes. Federal lawmakers are finally responding by attempting to pass spam laws of their own. Can the feds succeed where the states have not?

Popular demand for a cure to the spam-demic has prompted a flurry of new federal legislation, aggressive legal action, and innovative technological proposals. Yet none of these responses guarantees relief, and some might make things worse over the long term.

That's because two battles are being waged over spam. The first is the one legislators are fighting today over how to keep your e-mail account free of sleazy come-ons for pornography, herbal Viagra, and other junk. The second battle involves what your in-box will look like if and when the slimy spam messages are eradicated. Mainstream marketers—the Citibanks, Fords, and Microsofts of the world—and large ISPs, which may end up profiting from the traffic, want to be able to deliver ads to your in-box until you tell them to stop (a procedure known as "opting out").

The antispam community—which consists largely of individual activists and small-to-midsize ISPs—wants legislation that requires any marketer, sleazy or otherwise, to obtain your permission before it can send you a message: the "opt-in" approach. Otherwise, they say, the volume of commercial mail most people receive could grow large enough to kill e-mail as a communications medium.

Billions of dollars—and the future of your in-box—are riding on the outcome. And so far, the marketers are winning.

DOWN BY LAW

LAST APRIL, SENATOR Conrad Burns (R-Montana) stood before 400 attendees at the Federal Trade Commission's Spam Forum in Washington, D.C., and declared that spam is "killing e-mail, the very tool we use every day." The senator's appearance was intended to drum up support for the Can-Spam Act, which Burns cosponsored with Senator Ron Wyden (D-Oregon).

This act would impose stiff criminal and civil penalties for sending fraudulent e-mail—messages that use bogus address



CALIFORNIA STATE
Senator Debra Bowen

"The only thing spammers will understand is if they can't make money anymore. That's the only thing that will stop this."

information, deceptive subject lines, and misleading or spurious content. But it's just one of a half-dozen similar federal bills that lawmakers have proposed this year. (See "Who Can Can Spam?" on page 125.) In April, Representative Zoe Lofgren (D-California) introduced the Reduce Spam Act, which would require e-mail advertising to bear an ADV label, and would establish rewards for users who turn in spammers. Senator Charles Schumer (D-New York) introduced the Stop Pornography and Abusive Marketing Act (the SPAM Act) in mid-June; it proposes to create a registry of people who don't want to receive e-mail advertising, similar to the telemarketing industry's Do Not Call list.

The federal bill with the best chance of passing this year may be the Reduction in Distribution of Spam Act (RID Spam), introduced last May in Congress by Representative Richard Burr (R-North Carolina). Burr's bill would penalize spammers who harvest e-mail addresses, use false or misleading information, send pornographic images, or fail to abide by consumers' opt-out deci-

sions. Violators could face prison terms of up to two years and could have to pay statutory damages of up to \$3 million.

Burr's bill has two powerful cosponsors—Representatives Billy Tauzin (R-Louisiana), chair of the House Energy and Commerce Committee; and F. James Sensenbrenner Jr. (R-Wisconsin), chair of the House Judiciary Committee—and it is endorsed by the Direct Marketing Association, a powerful industry lobby.

Some federal bills, like Burns-Wyden, would preempt stronger state laws; antispammers argue that those bills would make prosecuting spammers more difficult because they would substitute hard-to-prove fraud statutes for existing consumer-protection guidelines. Other proposals, like Lofgren's and Burr's, would rely largely on overburdened state and federal authorities to pursue violators and would prevent consumers from filing antispam civil suits. And all currently proposed federal legislation would require users to opt out of mailings—freeing marketers to send you an initial pitch without penalty. Furthermore, even if you opt out, nothing would prevent a company from selling your name

to other marketing firms or starting to send you ads from one of its subsidiaries (see "Spam Laws: Opt-In vs. Opt-Out," page 128).

John R. Levine, author of *Internet for Dummies*, says that laws based on an opt-out approach are "hopeless." "I get mail from a dozen different spammers every day," Levine says. "Am I supposed to spend an hour every day figuring out the opt-out hoops they want me to jump through?"

After several years of inaction, Congress may pass one of these bills this year. Too bad none of them is the right one.

BETTER SOLUTIONS

THE STRONGEST ANTISPAM legislation currently on the table in the United States isn't before the U.S. Congress at all. In May, the California Senate approved Senate Bill 12, sponsored by State Senator Debra Bowen (D-Redondo Beach).

Bowen's SB 12 takes as its model the federal Telephone Consumer Protection Act of 1991. Better known as the Junk Fax Law, the TCPA has proved extremely effective against unsolicited

COMPARING THE BILLS

WHO CAN CAN SPAM?

CONGRESS IS WEIGHING a number of proposals designed to put a lid on unsolicited commercial e-mail, but none requires advertisers to obtain your permission before sending ads to your in-box. A California state bill does.

FEDERAL BILLS	Primary sponsor(s)	Pros	Cons	Status
Ban on Deceptive Unsolicited Bulk Electronic Mail Act of 2003 (S.B. 1052)	Sen. Bill Nelson (D-Florida)	Applies Racketeering Influenced and Corrupt Organization (RICO) statutes to spammers; lets users sue spammers.	Like every other federal antispam law, requires users to opt out of future mailings.	Newly introduced; too soon to tell its chances.
Can-Spam Act (S.B. 877)	Sen. Conrad Burns (R-Montana), Sen. Ron Wyden (D-Oregon)	Serious financial and criminal penalties for fraudulent e-mail (such as messages with false address information).	Preempts stronger state laws; requires opt-out; limits private right of action to ISPs, thus putting almost the entire burden on law enforcement.	First introduced in 1999, it has never come to a floor vote.
Computer Owners' Bill of Rights (S.B. 563)	Sen. Mark Dayton (D-Minnesota)	Sets up "do not spam" registry; allows fines of \$10,000 for each violation.	Requires users to opt out of future mailings; relies on FTC enforcement, with no private right of action; maintaining and securing registry could be challenging.	Now in committee, it has received little attention.
Stop Pornography and Abusive Marketing Act (S.B. 1231)	Sen. Charles Schumer (D-New York)	Would create national opt-out list, similar to Do Not Call list for telemarketing; includes civil and criminal penalties.	Huge database management challenge; securing it against abuse could also prove daunting.	Endorsed at its introduction by Christian Coalition, but opposed by marketing lobby.
Reduce Spam Act (H.R. 1933)	Rep. Zoe Lofgren (D-California)	Spam must be labeled with ADV; or ADV:ADLT; lets users sue; establishes rewards for turning in violators.	Minimal damage awards (\$10 per spam message); requires opt-out.	Little support from anti-spammers or marketers.
Reduction in Distribution of Spam Act of 2003 (H.R. 2214)	Rep. Richard Burr (R-North Carolina), Rep. Billy Tauzin (R-Louisiana), Rep. F. James Sensenbrenner Jr. (R-Wisconsin)	Includes criminal penalties; imposes fines up to \$3 million for falsified mail and for e-mail address harvesting.	May preempt stronger state laws; limits private suits to ISPs.	Odds-on favorite has powerful backers and support from marketers.
Wireless Telephone Spam Protection Act (H.R. 122)	Rep. Rush Holt (D-New Jersey)	Amends Communications Act of 1934 to prohibit wireless spam.	Limited to cell-phone text messaging.	May be added to other spam legislation, but unlikely to pass on its own.
STATE BILL				
SB 12 (California)	California Sen. Debra Bowen (D-Redondo Beach)	Requires advance permission to send commercial e-mail; allows users to sue for damages.	No cap on legal fees could mean a bonanza for attorneys; does not define a minimum number of recipients to qualify a message as spam.	Passed by California Senate; if enacted, it could still be preempted by a federal law.

faxes. SB 12 prohibits sending commercial e-mail without a consumer's prior permission, and it permits individuals who receive unsolicited commercial e-mail messages to sue for \$500 to \$1500 per offense. So a consumer who received ten pieces of e-mail from one spammer could sue for \$5000—or \$15,000, if a court deemed the violation intentional.

"The only thing spammers will understand is if they can't make money any more," says Bowen, who wrote California's existing opt-out antispam statute. She now says a stronger law is needed. "That's the only thing that will stop this." (A 1997 U.S. Senate bill sought to amend the Junk Fax Law to cover junk e-mail, but it died in committee.)

Antispam activists widely favor giving individuals the right to sue spammers for damages—known as a private right of action—but marketers oppose it, fearing that such a right would result in a rash of suits against legitimate advertisers. Meanwhile, the marketers argue, underground spammers would go untouched.

"It essentially provides incentives for plaintiff attorneys to go

after easy-to-hit targets, which are legitimate businesses," says Trevor Hughes, executive director of the E-mail Service Providers Coalition. Hughes points to a Utah statute that allows individuals to sue mailers for up to \$25,000 per day for sending bulk mail that lacks a valid street address or ADV label. He says attorneys have exploited the law to pursue judgments against companies that hired marketers without knowing exactly how they operated.

Attorney David Kramer, who represented the ISPs CompuServe and Concentric in lawsuits against self-proclaimed "Spam King" Sanford Wallace during the mid-1990s, agrees that the Utah antispam law is flawed; he adds that California's SB 12 lacks a cap on damages, leaving it open to abuse. But he says, "It's a problem that can be solved with a few minutes of careful drafting.... Any law that doesn't have a private right of action is paying lip service to the problem instead of solving it."

According to Andrew Barrett, executive director of The Spam-Con Foundation, a nonprofit antispam organization, any spam law should absolve bulk mailers who obtain permission before

sending mail, yet should allow individuals and ISPs to enforce the law through private legal action. "Those two things absolutely must happen together," he says. "Almost anything else is worse than no federal law at all."

The success of the anti-junk fax TCPA indicates that a well-crafted law could have an impact on spam. "We didn't see a tidal wave of junk-fax litigation," Kramer says, "but we certainly saw enough to hold back the flood of junk faxes we used to receive."

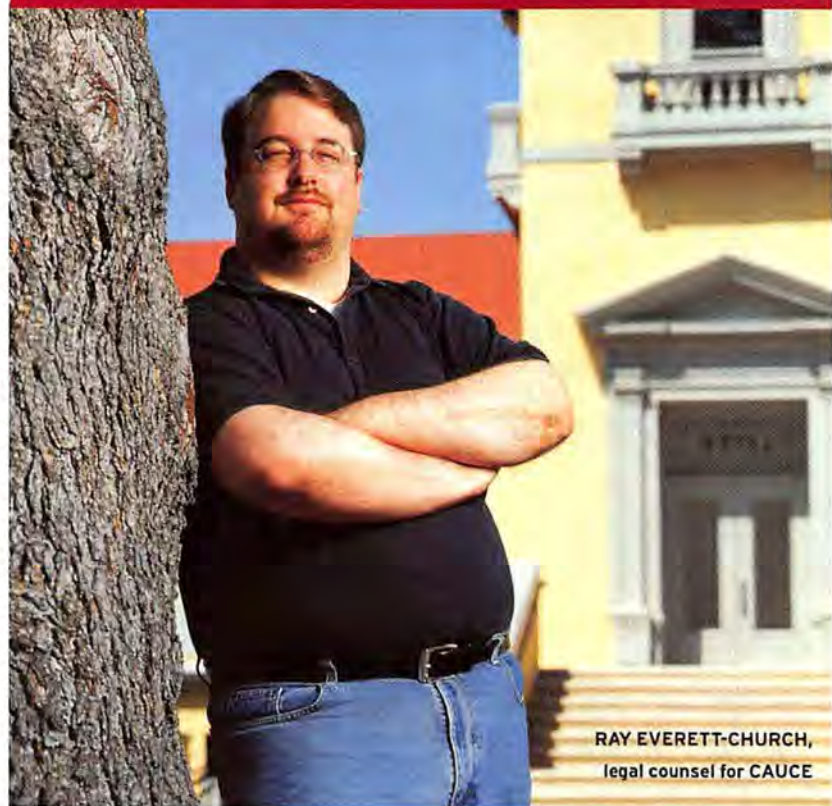
FOLLOW THE MONEY

AS YOU MIGHT EXPECT, opt-in opponents include not only some of the most powerful marketers in the world, but also ISPs such as America Online, EarthLink, and Microsoft Network.

Large ISPs that charge fees for delivering ads oppose any scheme that might limit the volume of mail they can send; and the Direct Marketing Association argues that an opt-in law would choke off Net commerce, preventing new businesses from making themselves known to consumers. "For opt-in to work, consumers would already have to know the entire universe of all offerings, all markets, at all times," says Louis Mastria, director of public and international affairs for the DMA. "When you go to an opt-in law, you close off the universe to new entrants."

Jennifer O'Shea, an aide to Senator

"Direct marketers have put quite a bit of fear in the minds of legislators that an opt-in approach will destroy all marketing on the Internet."



RAY EVERETT-CHURCH,
legal counsel for CAUCE

PHOTOGRAPH: ROBERT CARDIN

Burns, says that the Burns-Wyden bill is designed to punish fraudulent spammers while permitting legitimate advertisers to "take a shot" at reaching consumers through e-mail. "Senator Burns feels we shouldn't put an end to the opportunity for legitimate businesses to be working with e-mail and the Internet," she adds.

Antispam advocates reply that tech-savvy marketing companies have been using opt-in lists with great success. "Direct marketers have put quite a bit of fear in the minds of legislators that an opt-in approach will destroy all marketing on the Internet," says Ray Everett-Church, counsel for the Coalition Against Unsolicited Commercial E-mail (CAUCE). "But there are many in the direct marketing industry who've gone completely to opt-in and are doing tremendous volumes of business as a result."

The E-mail Service Providers Coalition's Hughes acknowledges that some legitimate senders are moving toward opt-in, but he opposes any laws that would mandate obtaining such permission. "The opt-in/opt-out debate has led to four or five years of stasis," Hughes says. "We need to move forward by accepting a standard like Burns-Wyden and focus on building accountability into the system."

In an open letter to Congress, CAUCE condemned opt-out bills. "In our opinion, these bills have no business being called 'anti-spam.' [They] do little more than establish minimal ground-rules for a federal license to spam. If marketers can meet these rules, they may send as much e-mail as they wish."

THE ENFORCERS

ANOTHER BIG SNAG is enforcement. Most federal proposals give the FTC and state attorneys general more power to go after spammers, but limited resources and competing priorities make adjudication of many spam cases unlikely.

The FTC has filed 53 civil suits against spammers that allegedly used deceptive practices, says staff attorney Brian Huseman. One case required 21 separate subpoenas before investigators could identify the spammers' true location—and this case involved e-mail messages that listed a physical address, which should have made the spammers easier to find. With more than 130,000 spam complaints pouring into the FTC's offices each

DAM THE SPAM

FIVE STEPS TO STOP SPAM

NO SINGLE SOLUTION will put an end to all spam, but these tactics could slow it down.

A federal law that relies on opting in: Antispammers and even some e-marketers agree that only recipients who ask to receive e-mail advertising can accept it with equanimity. A federal law based on opting in, requiring advertisers to get a request from you before they e-mail you, may be the only way to stop both spammers and mainstream marketers from cramming your in-box.

Send spam, go to jail: Virginia mandates criminal penalties for spammers who falsify e-mail addressing information. New York State Attorney General Eliot Spitzer has initiated criminal proceedings against Howard Carmack, aka The Buffalo Spammer, charging that he used stolen identities in his spamming activities. Putting spammers in the slammer might convince some of them to find a new line of work.

Unleash the lawyers: Leaving antispam enforcement to understaffed bureaucracies is no solution. Freeing an army of angry users (and ISPs with deep pockets) to sue spammers out of existence would be much more effective. Antispammers and their lawyers have already ferreted out most of the worst offenders, but imagine their zeal if money were involved.

Charge bulk e-mailers postage: Adding a "postage" fee—say, one tenth of a cent



for each message—that kicks in only when senders attempt to deliver 1000 or more messages a day would deter many spammers. ISPs would be happy to collect (and keep) the fees, and legitimate marketers could receive a favorable rate if they adopted consumer-friendly practices. On the other hand, some observers argue that, once bulk mailers have to start paying for e-mail, individual users will be next.

More-imaginative technological solutions: A promising idea called HashCash, which would be implemented on ISPs' servers, makes a sender's computer solve a complex equation for each message before the ISP will deliver it. It causes a trivial delay for most senders but slows a spammer's mail delivery to a crawl. Another innovation: EPrivacy Group's Spam Squelcher detects spam coming into a network and slows the connection to submodem speeds until the spammer gives up and looks for another victim.

day, the agency can pursue only the most egregious offenders.

Meanwhile, AOL, EarthLink, and MSN resort to private litigation. Last year, EarthLink sued spammers for trespass, breach of contract, and violations of the Computer Fraud and Abuse Act, among other statutes. "I've got my guns loaded with a dozen bullets, any one of which would get the spammer," says Atlanta attorney Pete Wellborn, who won judgments of \$24 million and \$16.4 million for EarthLink. In June, Microsoft filed 15 suits against marketers for sending 2 billion unsolicited messages.

Of course, pursuing spammers isn't always easy, because they can set up shop abroad, and they aren't required to disclose ►

their location. The Center for Democracy & Technology's Ari Schwartz notes that the Junk Fax Law is easier to enforce than a similar spam provision would be because the sender can't fake the source of the faxes—the sending number—and faxing from overseas greatly increases costs. "Spammers can move offshore," says Schwartz. "Junk faxers can't."

Wellborn says that most spammers have a financial link to the United States that plaintiffs can use to find out who's sending the messages. "It's very rare that spam will ask a recipient to send a payment to Timbuktu," Wellborn explains. "There's almost always a U.S. connection through which you can track the money and identify the responsible party." In most cases, the company whose products or services are being marketed, or the marketer, or both parties may be held accountable. Experts say that most of the spam delivered to U.S. addresses originates in the United States, even if the senders route it through foreign servers. Furthermore, foreign spammers are subject to U.S. laws governing civil liability if they spam U.S. residents.

TAKE A STAND AGAINST SPAM

MOST MARKETERS, ISPs, and antispammers agree that only a combination of strong federal laws, effective litigation, and technological innovation will solve the spam problem.

Some Capitol Hill insiders believe that Congress will have to act against spam. "We've reached a point where people are saying, 'The spam problem is extreme—let's get something that can pass and make a difference,'" says Schwartz.

That mood makes antispammers nervous. "We're worried that in its haste to do something—anything—about the problem," SpamCon's Barrett says, "the current Congress is going to pass legislation that'll be incredibly damaging to the Internet and everyone who uses it."

Contributing Editor Daniel Tynan shovels spam from his in-box in Wilmington, North Carolina. See find.pcworld.com/36284 to read about the latest in technology used to fight spam.

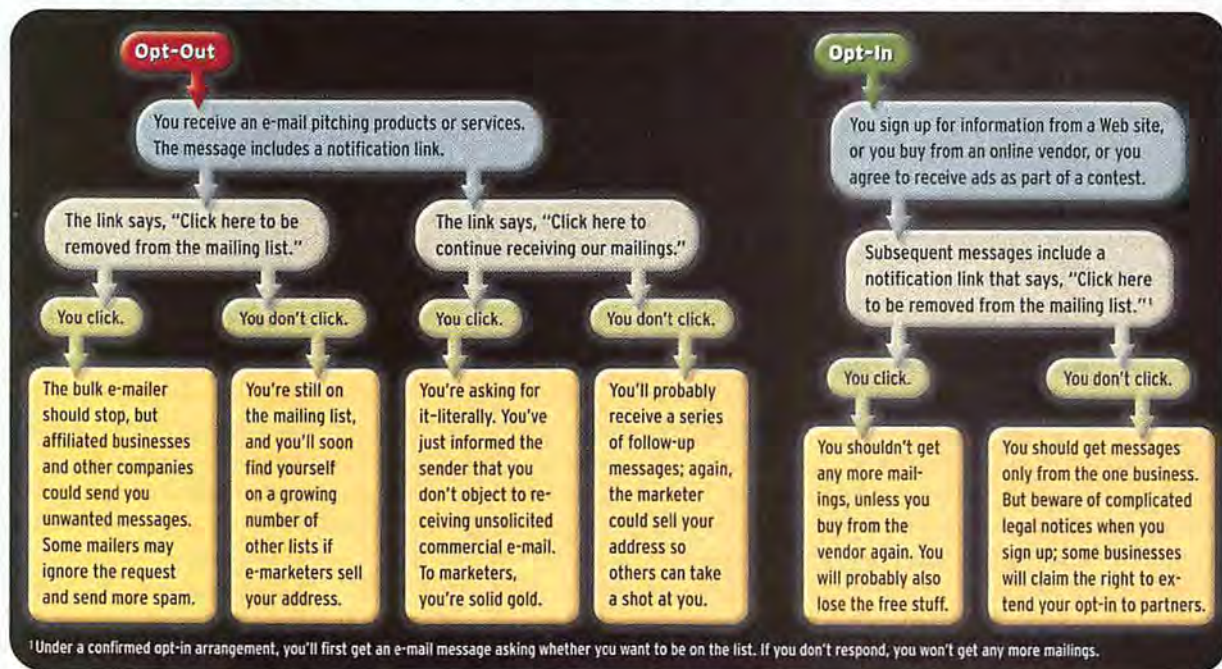
LEGAL DEFINITIONS

SPAM LAWS: OPT-IN VS. OPT-OUT

EVERY FEDERAL LAW under consideration relies on an opt-out scheme: You must take action to prevent a marketer from sending you additional e-mail. Under that setup, some marketers may send a one-time mailing to gauge your interest. Some may give up if you don't reply; others will keep spamming until you tell them to stop.

With an opt-in proposition, ideally, you would have to give permission before receiving any e-mail, but the actual practice can be tricky.

For example, having purchased a product from a vendor may be interpreted as proof of a "preexisting business relationship," in which case the vendor would be free to send you an e-mail under most opt-in requirements. In other cases, you may unwittingly opt in to e-mail ads by signing up for free newsletters or online contests. Confirmed opt-in, in contrast, adds a step in which marketers must get you to verify your subscription before they can send any further mailings.



Intel® Pentium® 4 Processor at 3.06GHz with HT Technology
533 FSB and 512KB Advanced Transfer Cache
Intel® 845MP + iCH3M Chipset Motherboard
512MB PC-2100 DDR SDRAM
15.0" UltraXGA+ Enhanced TFT Active Matrix LCD
ATI® Mobility RADEON™ 9000 PRO 128MB DDR
Dual-View Display Monitor and TV Out
40GB 5400RPM Ultra ATA100 Hard Drive

High-Performance Heatsink-Cooling System
Removable 24X/10X/24X CD-RW/DVD Combo Drive
Sound Blaster® PRO Compatible with Wavetable
5.1 3D Surround Sound with S/PDIF Digital Output
One Type II PCMCIA Slot
Four USB 2.0 Ports and One IEEE 1394 Port
Infrared Wireless Fast IR Interface
Built-In Wireless 802.11a+b Mini-PCI Card
10/100Mb Ethernet LAN and 56K Modem
Dimensions: (H) x (W) x (D): 1.7" x 13" x 11.4"
Exclusive Metallic Majestic Blue Chassis
Exclusive 120-Watt A/C Adapter
NEW! Alienware® 16MB USB 2.0 Flash Drive
Microsoft® Windows® XP Home Edition
AlienAdrenaline: Video Performance Optimizer
AlienAutopsy: Automated Technical Support
Personalized Owner's Manual
FREE Exclusive Alienware® T-Shirt
FREE Alienware® iUnc™ Surface Pad
Optimized & Configured for High-Performance
AlienCare: Advanced Gaming Technical Support including
Lifetime Personalized Online Support Portal
1-Year Toll-Free 24/7 Phone Support by Alienware Technicians
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Intel® 875P Chipset (Based Motherboard)
512MB Dual Channel PC-3200 DDR SDRAM
120GB 7200 RPM Serial ATA-150 Hard Drive 8MB Cache
NVIDIA® GeForce™ FX 5900 Ultra 256MB Graphics Card
with DVI and S-Video Out

High-Performance Heatsink-Cooling System
Sound Blaster® Audigy 2™ 6.1 Sound Card with EAX Advanced HD
Black 16X/48X DVD-ROM Drive
Black 52X/24X/52X CD-RW Drive
Exclusive Space Black Alienware® ATX Case 420Watt P/C
Space Black Microsoft® Internet Keyboard
Space Black Microsoft® IntelliMouse Explorer 3.0
Intel® Gigabit Ethernet Adapter

NEW! Alienware® 16MB USB 2.0 Flash Drive
Microsoft® Windows® XP Home Edition
NEW! Fusion Real Aesthetics™ Video Cooling System
AlienAdrenaline: Video Performance Optimizer
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CLASS ACTS

AWARD-WINNING COMPANIES LEAD THE CHARGE FOR QUALITY AND VALUE

The Internet gave birth to literally thousands of new companies fueled by big ideas, big financial backing, and big aspirations. Then came the bust, and most of these companies, along with some others that had been around for a while, went away. As customers paused to catch their breath, many asked themselves, "What separates the really great companies from the rest of the pack? Which ones can I trust will be around for the long haul?"

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www.lge.com

Those are important questions to ponder because most indicators are pointing toward economic recovery, which means both business and consumer buyers

are back into buy-mode. Moreover, growth in some areas could be very swift. For example, IDC estimates that the 25 million instant messaging users of today will blossom to 200 million in three years, and the 100 million wireless users today will skyrocket to 480 million by 2006. Clearly, great growth is just ahead. When considering which vendors to buy from, it's more important than ever to sort out the real winners from the also-rans.

**World Class and Worldwide:
Products from Brother**

Leadership in any field is not defined by a single event. Rather, leadership and excellence are the result of sustained effort and accomplishment over time. So it is with Brother (www.brother.com), a global leader in office technology products that has been honored not once but four times by *PC World* with its prestigious World Class Award. For 2003, Brother has been cited for its highly acclaimed HL-5040 Personal Laser Printer.



This highly affordable, high-performance laser printer

▲ **The Brother HL-5040 Personal Laser Printer: High performance at an affordable price**

equally serves both PC and Apple users. Producing up to 17 pages per minute, the printer delivers high-quality output, HQ-1200 resolution, and robust standard memory, and it includes high-speed USB 2.0 and parallel interfaces. An optional external Ethernet print server is also available.

Continued on page 3

Small Workgroup Office ●

● Branch Office

● Corporate Office

Road-Warrior Office ●

● Home Office

**Take cost out of your business and increase productivity.
No matter where you do business.**

The Brother Advantage

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- Increased productivity
- Lower acquisition costs
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Desktop Laser Solutions



Color Laser Solutions



Network Printer Solutions



Multi-Function Solutions



Fax Solutions

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Considering that over 94% of Fortune 1000 company employees* work outside corporate headquarters, equipping them with a cost-effective solution is, to say the least, a major challenge.

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* Purchase Influence in Larger American Businesses (Erdos & Morgan, 2001).



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**PCWORLD
WORLD
CLASS
2003**



Award Winning HL-5040 Laser Printer



Continued from page 1

As evidenced by its multiple awards from *PC World* and other distinguished publications, Brother's product integrity and value extend throughout the company's product portfolio—including monochrome and color laser

printers, laser and ink-jet multi-function devices, fax machines, electronic labeling machines, and more.

Celebrating its 50th anniversary in the U.S. next year, Brother continues to serve its customers with world-class products that consistently deliver excellent reliability, features, and value.

■ For more information, click on www.brother.com.

LG Electronics: Drives for Success

The tremendous growth in the demand for storage—growth that continued almost unabated even during the recession and that shows no sign of pausing—is particularly noticeable in small and medium-size businesses. Of all the kinds of storage devices available for these businesses, says a recent IDC study, the one that is found most commonly is CD-RW. Shipments of DVD recordable drives will triple between this year and 2005.

Consumers, too, have flocked to these exciting storage technologies. Floppy disks have gone the way of sealing wax as users seek effective ways of storing massive multimedia, music, and video files, not to mention the hundreds and thousands of digital photos everyone seems to be snapping these days. The question is, from whom should you buy your storage technology?

"Solid speed, an attractive price, and good support policies make this drive a winner." So wrote *PC World* in anointing the LG Electronics GCC-4480B CD-RW combination drive as a 2003 World Class Awards winner. But the truth is, those same qualities—namely quality, value, and after-sales support—could as easily apply across the board to all the technology available from LG Electronics (www.lge.com).

That's because LG Electronics is a recognized global leader, leveraging its core strengths in optical and other digital technologies to bring to market high-grade DVD and CD burners, LCD and plasma monitors, and wireless products. It is LG Electronics' commitment to excellence that has made the company the world's largest maker of CD/DVD drives and the num-

ber-two maker of LCD panels. Part of this commitment is reflected in the three-year replacement/repair warranties that accompany each LG Electronics monitor, with replacements shipped in two days or less.

The good news is that while LG Electronics has always supplied monitors and other PC peripherals sold under popular PC brand names, the company is now developing and expanding its own line of products. Following up on the award-winning GCC-4480B CD-RW drive is LG Electronics' GCC-4520B, an even faster combination drive that supports 52x24x52 CD speeds and 16x DVD reading.



▲ **LG Electronics' GCC-4520B CD-RW drive supports 52x24x52 CD speeds and 16x DVD reading.**

Also, LG has introduced the GSA-4040B 4X Super-Multi DVD writer, capable of writing to DVD-format, DVD+ format, and DVD-RAM format; and the 23-inch L2300A wide-screen LCD monitor, as well as the 30-inch L3000A wide-screen LCD monitor.

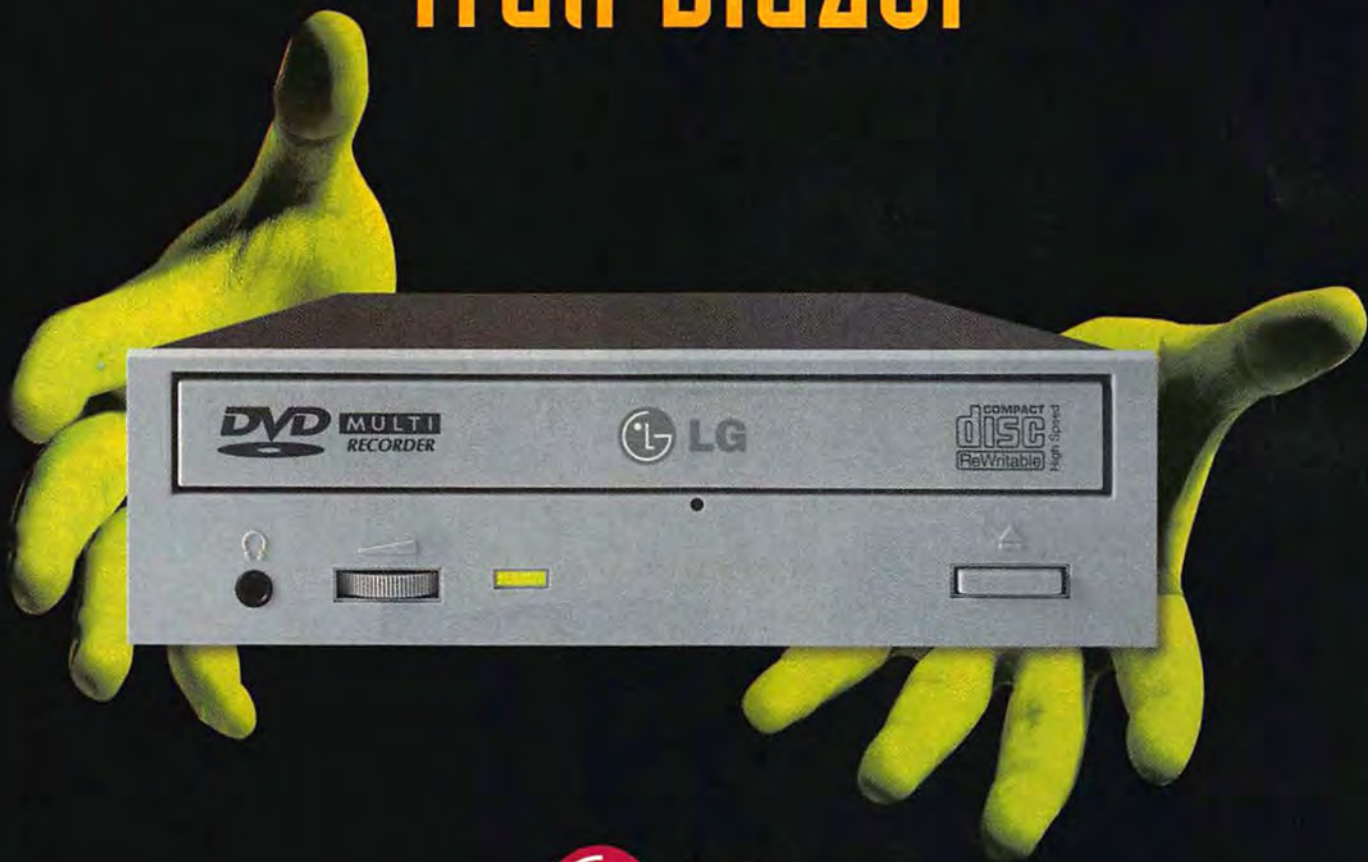
■ Click on www.lge.com now for more information on these and other value-rich technology product from LG Electronics.

Stick With a Winner

If there is one thing in which the computer industry has been particularly proficient, it is churning out one generation of high-tech gear after another, with each generation usually being cheaper and more full-featured than the previous one. For buyers, this is all great news.

Just remember that some of the companies that produce these technologies come and go as fast as the products they make. If you buy from one of these, you are left with technology that may have neither support nor an upgrade path. The best advice is to stick with the winners, including those that receive the unbiased accolades of independent publications. That way you'll know you're getting products made to last—by companies likely to last as well.

Trail Blazer



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Kick into overdrive with the new **Super Multi-Format 4x DVD± R/RW/RAM, CD-RW** drive. The GSA-4040B does it all. It reads and writes CDs and 3 formats of DVD (+, -, RAM)...fast. Quality like this is standard procedure at LG. Follow the leader – visit www.LGeus.com for more information about all LG computer products.

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LG, a \$90 billion plus company, is ranked #1 worldwide in the manufacturing of CD/DVD Drives.

**GSA-4040B
SUPER MULTI DRIVE**

**4X DVD± Writer, E-IDE
DVD± R/RW/RAM, CD-RW**

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GCC-4480B
GCE-8520B

Optical Storage: DVD± RW • CD-RW • CD-RW/DVD Drives FLATRON Monitors: LCD • FLAT Tube • ez Flat Tube

TOP 100

EDITED BY REVIEWS STAFF

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Top 15 Desktop PCs

HP's affordable Pavilion 764N has everything you need to make your own DVD movies: FireWire ports, a big hard drive, editing software, and a rewritable DVD drive.

Dirt-Cheap Desktops With DVD

TEST Center Most desktop PC vendors offer rewritable DVD drives with their high-end systems, but a few are starting to include them on low-priced PCs as well. Two new value models on our *Top 15 Desktop PCs* chart reflect this tendency: The \$1139 ABS Bravado 2280 and the \$1349 HP Pavilion 764N each come with a 4X DVD+RW drive.

The trend extends to notebooks, too. The value-priced Toshiba Satellite 2455-S305 on our *Top 15 Notebook PCs* chart has a DVD-RW drive but no floppy drive. The new Best Buy on the power side, Toshiba's Tecra S1, packs a DVD-ROM and CD-RW combo drive, but it can't burn DVDs.

Freelance writers Dan Littman, Mick Lockey, and Carla Thornton, and PC World reviews editors Richard Baguley, Eric Butterfield, Tracey Capen, Seán Captain, Rebecca Freed, Alexandra Krasne, Kalpana Narayanamurthi, and Alan Stafford contributed to the Top 100 section this month. Ulrike Diehlmann, Julio Giannobile, Elliott Kirschling, Jeff Kuta, Tony K. Leung, and Thomas Luong of the PC World Test Center performed testing on the products reviewed in this section, with logistical support provided by Julian Weatherby.

145



Top 10 Monitors

Dell's UltraSharp 1901FP, which tops this month's collection of 19-inch LCDs, can swivel, adjust for height, and pivot.

147

Top 10 Hard Drives

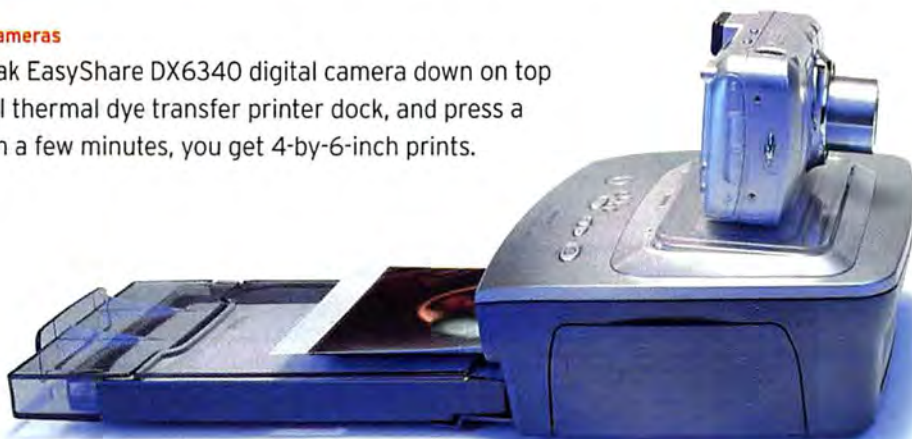
The gigs are up and the prices are down on this month's hard drives chart. Several drives on the list cost about \$1 per gigabyte.



149

Top 10 Digital Cameras

Plop the Kodak EasyShare DX6340 digital camera down on top of its optional thermal dye transfer printer dock, and press a button—and in a few minutes, you get 4-by-6-inch prints.



YOUR GUIDE TO THE TOP 100

EACH MONTH, WE TEST a large number of PCs, printers, monitors, and other products. Only the best products land on the charts, which are refreshed monthly.

System configurations are shown as tested. The overall rating for each product is calculated on a 100-point scale and reflects results from our hands-on evaluations

and performance tests. A 90-point score is exceptional, while one in the 70s is above average.

The PC WorldBench 4 score is a measure of how fast a PC can run a mix of common business applications as compared with our baseline machine, a Gateway Select 1200 with a 1.2-GHz Athlon processor, 128MB of PC133

SDRAM, and a 20GB hard drive. For example, a PC that scores 120 is 20 percent faster than the baseline system. The support policies score is based on vendor support policies (not shown on charts). Please see find.pcworld.com/15720 for additional details on how we compile charts for the Top 100.

TOP 15 DESKTOP PCs

POWER SYSTEM		Overall rating	Street price (5/22/03)	PC WorldBench 4 performance score ¹	Faster	Comments
1	Best Buy ABS Awesome 3450 find.pcworld.com/34736	91	Very inexpensive \$1929	Windows XP Home	Very good 133	The speedy 3450 has an innovative pewter-tone case with a handle and a power switch mounted on top. (★★★★☆ June 03)
2	Dell Dimension 8300 find.pcworld.com/35246	87	Expensive \$2999	Windows XP Home	Good 126	Well-designed Dimension with a roomy interior comes with a high-end graphics card and plenty of disk space. (★★★★☆ July 03)
3	Sys Technology Performance 3000+ find.pcworld.com/34112	87	Average \$2476	Windows XP Professional	Outstanding 136	Fastest PC on the chart has a great-sounding, six-speaker audio system; the price falls \$301 this month. (★★★★☆ May 03)
4	Micro Express MicroFlex 30A find.pcworld.com/34742	86	Inexpensive \$2199	Windows XP Professional	Very good 131	Quick and reasonably priced, the MicroFlex 30A includes a large LCD monitor and a graphics card with a TV tuner. (★★★★☆ June 03)
5	Gateway 700XL find.pcworld.com/35234	84	Very expensive \$3319	Windows XP Home	Good 126	This powerful system's huge amount of storage space and rewritable DVD drive make it suitable for video editing. (★★★★☆ July 03)
6	@Xi Computer MTower 3000+ find.pcworld.com/35651	NEW	Inexpensive \$2127	Windows XP Home	Very good 133	This speedy system provides ample storage and memory, and carries a very attractive price. (★★★★☆)
7	IBuyPower Night Dreamer XP find.pcworld.com/35645	NEW	Inexpensive \$2265	Windows XP Professional	Good 130	A nice monitor and an excellent set of Klipsch ProMedia 5.1 speakers accompany this solid PC. (★★★★☆)
Percent of overall rating ▶			10 percent	25 percent		

VALUE SYSTEM		Overall rating	Street price (5/22/03)	PC WorldBench 4 performance score ¹	Faster	Comments
1	Best Buy ABS Bravado 2280 find.pcworld.com/35636	NEW	Inexpensive \$1139	Windows XP Home	Very good 127	Includes a DVD+R/RW drive, a roomy hard drive, and a great set of Logitech Z-340 speakers for working with digital media. (★★★★☆)
2	NuTrend Mega 2 find.pcworld.com/34121	82	Very inexpensive \$899	Windows XP Home	Outstanding 129	Outperforms some power systems when running business applications. Neat, spacious case permits easy expansion. (★★★★☆ May 03)
3	HP Pavilion 764N find.pcworld.com/35642	NEW	Average \$1349	Windows XP Home	Good 115	Well-equipped budget system includes a fast DVD+R/RW drive and a multifunction media card reader. (★★★★☆)
4	Micro Express MicroFlex 24A find.pcworld.com/32891	82	Inexpensive \$999	Windows XP Home	Outstanding 131	Still one of the speediest models on the chart, this low-cost machine offers plenty of bang for the buck. (★★★★☆ Mar 03)
5	Dell Dimension 2350 find.pcworld.com/34109	81	Very inexpensive \$887	Windows XP Home	Good 110	This solid budget system is very cheap, but its performance is unremarkable and its features are unexciting. (★★★★☆ May 03)
6	Compaq Presario 6470nx find.pcworld.com/35237	80	Average \$1298	Windows XP Home	Good 111	A bit slow for its CPU class, the 6470nx has a fine 17-inch CRT and enough graphics power for 3D gaming at lower resolutions. (★★★★☆ July 03)
7	Polywell Poly 880NF2-2500 find.pcworld.com/34748	80	Inexpensive \$999	Windows XP Home	Very good 125	This low-cost Poly delivers good speed for business apps; the graphics card is somewhat weak for high-end gaming. (★★★★☆ June 03)
8	Gateway 300S find.pcworld.com/34127	80	Very inexpensive \$859	Windows XP Home	Fair 109	Handsome system lacks a CD-RW drive but includes a generous software bundle and a monitor that displays very sharp text. (★★★★☆ May 03)
Percent of overall rating ▶			20 percent	20 percent		

Go to find.pcworld.com/10860 for details on PC World's Star Ratings.

¹ Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. For more details, see "Your Guide to the Top 100" on page 135.

² Total capacity in gigabytes (may represent multiple drives).

REWITABLE DVD DRIVES used to be expensive accessories, but with supply and competition fully ramped up, these components are currently priced at about what CD-RW drives sold for when we first saw them really take off. And now systems on our value rankings are coming with rewritable DVD drives: Both the ABS Bravado 2280

(which grabs first place) and the HP Pavilion 764N (which finishes third) have 4X DVD+R/RW drives, even though the ABS costs a remarkably low \$1139 and the HP just \$1349. The HP system also includes a six-in-one media card reader that can accommodate CompactFlash Type I and II,

Visit find.pcworld.com/36095 for reviews of all products tested this month and ranked in this chart.

BASE CONFIGURATION						Extra features ¹	Graphics quality	Setup and ease of use	Vendor's reliability/service
CPU	RAM (MB/type)	Hard drive ²	Monitor	Graphics	Case type ³				
2.167-GHz Athlon XP 3000+	1024/DDR400 SDRAM	120	19-inch CRT	128MB Sapphire Radeon 9700 Pro	Midsized tower	Fair: 16X DVD-ROM drive, 52X/24X/52X CD-RW drive, Microsoft Works 7	Very good	Very good	Fair/Good
3.06-GHz Pentium 4	1024/DDR400 SDRAM	200	18-inch LCD	128MB ATI Radeon 9800 Pro	Midsized tower	Very good: 4X DVD+R/RW drive, 16X DVD-ROM drive, Microsoft Office XP Small Business Edition	Very good	Very good	Good/Fair
2.167-GHz Athlon XP 3000+	512/DDR333 SDRAM	180	17-inch LCD	128MB ATI Radeon 9700 Pro	Midsized tower	Good: 16X DVD-ROM drive, 52X/24X/52X CD-RW drive, wireless keyboard and optical mouse, memory card reader, Corel WordPerfect Office 2002	Outstanding	Good	1/1
2.167-GHz Athlon XP 3000+	512/DDR333 SDRAM	120	19-inch LCD	128MB ATI All-in-Wonder Radeon 9700 Pro	Midsized tower	Very good: 4X DVD-R/RW drive, 52X/24X/52X CD-RW drive, Pinnacle Studio 8	Outstanding	Good	1/1
3.06-GHz Pentium 4	512/DDR400 SDRAM	500	18-inch LCD	128MB ATI Radeon 9800 Pro	Tower	Outstanding: DVD-R/RW drive, 48X/24X/48X CD-RW drive, Microsoft Office XP SBE, Pinnacle Studio 8	Very good	Good	Fair/Fair
2.167-GHz Athlon XP 3000+	1024/DDR400 SDRAM	120	19-inch CRT	128MB Sapphire Radeon 9700 Pro	Midsized tower	Fair: 12X DVD-ROM and 32X/10X/40X CD-RW combo drive, Lotus SmartSuite Millennium, Ulead VideoStudio 6 SE	Very good	Good	1/1
2.167-GHz Athlon XP 3000+	1024/DDR400 SDRAM	120	19-inch CRT	128MB EVGA E-GeForce FX 5800 Ultra	Midsized tower	Fair: 16X DVD-ROM drive, 52X/24X/52X CD-RW drive, Microsoft Works 7	Very good	Good	1/1
10 percent						10 percent	15 percent	5 percent	25 percent

BASE CONFIGURATION						Extra features ¹	Graphics quality	Setup and ease of use	Vendor's reliability/service
CPU	RAM (MB/type)	Hard drive ²	Monitor	Graphics	Case type ³				
1.83-GHz Athlon XP 2500+	512/DDR333 SDRAM	80	17-inch CRT	64MB EVGA E-GeForce Ti 4200	Midsized tower	Very good: 4X DVD+R/RW drive, 16X DVD-ROM drive	Very good	Good	Fair/Good
2-GHz Athlon XP 2400+	512/DDR400 SDRAM	60	17-inch CRT	64MB Asus V9180TD (GeForce MX 440-based)	Midsized tower	Good: 16X DVD-ROM drive, 48X/24X/48X CD-RW drive, Corel WordPerfect Office 2002	Fair	Very good	1/1
2.67-GHz Pentium 4	512/DDR266 SDRAM	120	17-inch CRT	128MB Asus V8170 (GeForce MX 440-based)	Minitower	Outstanding: 4X DVD+R/RW drive, six-in-one media card reader, WordPerfect Productivity suite	Fair	Fair	Fair/Poor
2-GHz Athlon XP 2400+	512/DDR400 SDRAM	80	17-inch CRT	64MB Leadtek WinFast GeForce2 Ultra	Midsized tower	Fair: 16X DVD-ROM drive, 40X/12X/40X CD-RW drive, Ulead VideoStudio 6	Fair	Fair	1/1
2.4-GHz Pentium 4	256/DDR266 SDRAM	60	17-inch CRT	Integrated Intel 845G using main memory	Minitower	Good: 48X/24X/48X CD-RW drive, 24X-48X CD-ROM drive, Corel WordPerfect Productivity Suite	Poor	Good	Good/Fair
2.66-GHz Pentium 4	512/DDR266 SDRAM	120	17-inch CRT	64MB ATI Radeon 9000	Minitower	Very good: 16X DVD-ROM, 48X/12X/48X CD-RW drive, Microsoft Works 7	Very good	Fair	Fair/Poor
1.83-GHz Athlon XP 2500+	256/DDR333 SDRAM	80	17-inch CRT	Integrated NVIDIA nForce2 using main memory	Midsized tower	Fair: 16X DVD-ROM drive, 52X/24X/52X CD-RW drive, Lotus SmartSuite 9.7, Ulead VideoStudio 6	Fair	Good	1/1
2.4-GHz Pentium 4	256/DDR333 SDRAM	40	17-inch CRT	Integrated Intel 845G using main memory	Mini-tower/desktop	Good: 16X DVD-ROM drive, Microsoft Works 7, Corel WordPerfect Productivity Pack, Quicken 2002	Fair	Very good	Fair/Fair
10 percent						10 percent	10 percent	5 percent	25 percent

¹ Vertical cases are towers (over 20 inches), midsized towers (15.5 to 20 inches), or minitowers (under 15.5 inches). Horizontal cases are desktops (5 inches or taller) or compacts (under 5 inches).

² Unless otherwise stated, systems come with a modem and network adapter.
³ Insufficient data to give a rating.

⁴ Case can be placed in either orientation.

Secure Digital, MultiMediaCard, Memory Stick, and SmartMedia memory cards.

On the power side, two new systems debut in the lower reaches of the chart. The @Xi Computer MTower 3000+ provides a gigabyte of fast, dual-channel DDR400 memory and 120GB of disk

space. In our PC WorldBench 4 tests, it posted a lofty score of 133—only a little behind the highest score on the chart, the 136 achieved by the Sys Performance 3000+. And at \$2127, it's reasonably priced for a PC with a range of top-notch components. The IBuyPower Night ▶



THE ABS BRAVADO 2280, priced at under \$1140, comes with a rewritable DVD drive.

Dreamer XP has the same memory and hard-drive configurations and capacities, though at \$2265 it is slightly more expensive. Nevertheless, the Night Dreamer XP did come with an excellent set of Klipsch ProMedia 5.1 speakers and a faster CD-RW drive than the MTower 3000+.

Several newly tested systems failed to make the chart this month. Even though the IBuyPower Value Pro is attractively priced at \$899 and includes a 52X/24X/52X CD-RW drive and Norton AntiVirus 2003, its overall set of features wasn't quite strong enough to push it into the Top 15. (We did not run our chart of under-\$900 PCs this month; instead, we have included these systems in the value section of the chart.) You can read a full review of the Value Pro at find.pcworld.com/35684. The EMachines T2385 (full review at find.pcworld.com/35681) is

nicely priced at \$810 and has some good features (such as a software bundle that includes both Microsoft Works 7.0 and Microsoft Money 2003), but its test performance was disappointing: It slogged its way to a PC WorldBench 4 score of 90, well behind the scores that similarly configured systems earned.

At \$749, HP's Compaq S3000nx is one of the cheapest systems we have seen in some time, and it comes with 256MB of DDR266 memory and a 17-inch FS7550 CRT monitor. Unfortunately, its performance was nearly as poor as that of the EMachines T2385: The S3000nx earned a disappointing PC WorldBench 4 score of 93. Its performance in our test games was equally lackluster, with frame rates that fell significantly below those for PCs costing a little more. Go to find.pcworld.com/35639 for a full review of the Compaq.

The Sys Mini PC 2800 is certainly one of the smallest systems we've seen: With a case size of just 2.4 by 6.2 by 8.1 inches, it can fit into the tightest spots. But \$1895 is twice the price of some similarly configured desktops we've reviewed. And the ultracompact size requires you to pay another price: Though the PC has four USB 2.0 and two FireWire ports, you can't add extra internal drives or PCI cards. Not that you'd want to open the case yourself—if you do so, you'll void the warranty. Sys says that if you want to add more memory, or a hard drive bigger than the 40GB one that our test system came with, you must buy the component from Sys, and the company will install it for free. Sys does not offer on-site service for this system, however, so you'll have to ship it back to the company for service. See find.pcworld.com/35648 for a complete review. ■

TECH TREND

Power for the People: Can Your Power Supply Cope?



THE POWER SUPPLY, though not the most exciting component, is one of the most important parts of your PC. It converts the electricity that flows from your wall socket into the various volt-

ages that your PC requires, smoothing any electrical noise and feeding all of your components without fuss. And because faster processors and graphics cards demand increasing amounts of power, keeping things humming can be an arduous task: For example, a 3.06-GHz Pentium 4 processor can suck down over 80 watts of power, while an ATI Radeon 9800 Pro graphics card can consume up to 70 watts when running at full speed.

Most power supply manufacturers quote a figure for the peak amount of power (in watts) that their products can deliver; the number usually falls in the range of 250 to 550 watts. But this data represents only a guideline: Don't assume that a 250-watt power supply can constantly deliver 250 watts without problems. See find.pcworld.com/35855 for details on how to calculate the maximum amount of power your system is likely to require.

Like most vendors, Gateway includes a 250-watt power supply in PCs such as the 700XL, which ranks fifth on this month's power system roster. Though you might conclude that 250 watts is inadequate to power a CPU, hard drive, optical drive, and other compo-

nents, Gateway claims that it has given its systems plenty of juice, since components seldom draw their rated maximum wattage during use. Gateway tested the power consumption of a system configured like the 700XL we reviewed, and says that the PC drew a maximum of 174.8 watts, with several programs and devices running at once and performing various tasks, including a CD-RW burn and a DVD read. In fact, Gateway says that you can safely add more power-hungry devices such as hard drives or graphics cards to its systems without fear. "Gateway designs power supplies so that a case can be fully loaded, with all card slots, memory connectors, and drive bays filled with the highest-performing components, plus overhead," says Gateway spokesperson Jason Martineck.

SHE CANNA TAKE THE STRAIN, CAPTAIN

WHAT ARE THE SIGNS that your power supply is failing or can't transfer enough juice to your PC? If your system starts to fail after you install a new component, your power supply may be the culprit. "Many users tend to blame system instability that begins after installing new components (particularly video cards or new CPUs) on the component or their OS," says Scott Richards, vice president of sales and marketing at Antec, which manufactures power supplies. "Often, [the problem] is that their system is underpowered or that they are using a power supply that does not deliver adequate voltage regulation. A crash during periods of major system use—such as a large write to a hard drive—or crashes that keep happening at the same place in certain software programs can be a sign that the power supply is unable to deliver the required power."

Finally, a PC for those who do everything at once. The ZT Desktop and Intel® Pentium® 4 Processor with HT Technology



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Integrated FireWire 1394 & Intel 10/100 LAN
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Intel® Pentium® 4 Processor 2.80GHz(800FSB)\$1,098.00
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52x24x52 CD-RW Drive
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Integrated 6 Channel Audio & Intel 10/100 LAN
U.S. Robotics 56K V.90 Fax Modem
3 Port FireWire 1394 (1 Back, 2 Front)
Inwin J508 Mid Tower Case w/300 Watt
Logitech Internet Keyboard & Wheel Optical Mouse
3PCS Speakers w/Subwoofer
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TOP 15 NOTEBOOK PCs

POWER NOTEBOOK			Overall rating	Street price (5/16/03)	PC WorldBench 4 performance score ¹ 	Comments
1	Best BUY Toshiba Tecra S1 find.pcworld.com/36074	NEW	89	Expensive \$2879	Windows XP Professional Outstanding 125	Conveniences include easy-to-use dual pointing devices and a Secure Digital slot. The battery life is the longest we've recorded thus far. (★★★★★ June 03)
2	IBM ThinkPad T40 find.pcworld.com/34817		88	Very expensive \$3249	Windows XP Professional Outstanding 124	Lightweight laptop has superlong battery life, dual pointing devices, and built-in wireless in Bluetooth, 802.11a, and 802.11b flavors. (★★★★★ June 03)
3	Gateway 450X find.pcworld.com/35312		88	Very inexpensive \$1899	Windows XP Professional Very good 117	Plain-looking one-bay notebook offers a great keyboard and includes legacy connections. (★★★★★ July 03)
4	Dell Latitude D600 find.pcworld.com/36077	NEW	87	Inexpensive \$2166	Windows XP Professional Outstanding 122	Solid midweight machine has an external battery power gauge and legacy ports, but unappealing sound and a springy keyboard. (★★★★★ July 03)
5	IBM ThinkPad R40 find.pcworld.com/34181		83	Inexpensive \$2149	Windows XP Professional Good 107	Well-designed midsize model includes a ThinkLight to illuminate the keyboard in dim light; 802.11b Wi-Fi is an extra-cost option. (★★★★★ May 03)
6	Toshiba Satellite Pro M15-S405 find.pcworld.com/35315		82	Inexpensive \$1999	Windows XP Home Poor 98	Handsome, black laptop has a Secure Digital memory slot and a great keyboard, but the touchpad can be tough to use. (★★★★★ July 03)
7	Compaq Evo N610c find.pcworld.com/32228		80	Very inexpensive \$1924	Windows XP Professional Average 101	A funky, silver wireless MultiPort module on the lid and dual pointing devices highlight this square black laptop. (★★★★★ Feb 03)
Percent of overall rating ▶			15 percent	20 percent		
VALUE NOTEBOOK			Overall rating	Street price (5/16/03)	PC WorldBench 4 performance score ¹ 	Comments
1	Best BUY Compaq Presario 2100Z find.pcworld.com/34823		80	Very inexpensive \$1024	Windows XP Home Good 102	Bargain portable has a tricolor case, colorful status LEDs, and useful application shortcuts, but middling sound. (★★★★★ June 03)
2	Dell Inspiron 500m find.pcworld.com/36080	NEW	80	Average \$1699	Windows XP Home Very good 114	Lightweight unit has an external battery-power gauge and a built-in spring-loaded tab release for removing bay devices. (★★★★★ July 03)
3	Toshiba Satellite 2455-S305 find.pcworld.com/34820		80	Average \$1699	Windows XP Home Outstanding 117	This notebook's eye-catching case colors, Secure Digital slot, and DVD burner should please creative professionals. (★★★★★ June 03)
4	Amax Elite 6033D find.pcworld.com/35318		75	Expensive \$1795	Windows XP Professional Very good 115	Unit designed for convenience includes slots for the latest types of memory cards and an optical drive on the front. (★★★★★ July 03)
5	Micro Express NP1024A find.pcworld.com/35321		75	Average \$1499	Windows XP Professional Very good 111	A cool bluish-silver lid, dedicated audio controls, and a Smart Media slot distinguish this unit. (★★★★★ July 03)
6	Toshiba Satellite Pro 6100 find.pcworld.com/31829		75	Expensive \$1857	Windows XP Professional Good 100	All-black box includes built-in 802.11b Wi-Fi and a modular bay capable of accommodating an optical drive or a second battery. (★★★★★ Jan 03)
7	Dell Inspiron 5100 find.pcworld.com/36083	NEW	75	Expensive \$1799	Windows XP Home Outstanding 117	Distinctive blue-and-silver laptop's hard drive and memory slots are easy to access. It also comes wireless ready. (★★★★★ July 03)
8	WinBook X4 find.pcworld.com/34826		73	Inexpensive \$1298	Windows XP Professional Average 91	Baby-blue notebook includes a combo drive for a reasonable price, but provides just average performance and battery life. (★★★★★ June 03)
Percent of overall rating ▶			20 percent	15 percent		

Go to find.pcworld.com/10860 for details on PC World's Star Ratings.

¹ Performance word scores reflect comparisons of PCs in the same category (power or value). For more details, see "Your Guide to the Top 100" on page 135.

² Except where noted, all Intel CPUs are SpeedStep chips, which run at a slower speed on battery power. (We performance-test all notebooks plugged in.)

³ In gigabytes.

TOSHIBA'S TECRA S1 sneaked past the IBM ThinkPad T40 to become our new number one power notebook this month.

The all-purpose portable's secret weapon? Price: Though the Tecra and the ThinkPad ran neck-and-neck in our speed and battery-life tests, the Tecra costs nearly \$400 less. Digital camera and PDA users may find

the Tecra's Secure Digital slot a plus, too.

Dell accounted for the other new notebooks this month. Its Inspiron 500m, a trim consumer unit, took second place on the value list with snappy performance and a nicely designed spring-loaded side release for its modular bay.

Visit find.pcworld.com/36086 for reviews of all products tested this month and ranked in this chart.

BASE CONFIGURATION							Extra features ⁴	Overall design	Battery life (hours:min) ⁵	Average weight (pounds) ⁶	Vendor's reliability/ service
CPU ²	Screen (inches)	RAM (MB)	Hard drive ³	Pointing device	Multi-purpose bays						
1.6-GHz Pentium M	15	512	40	Touchpad, eraserhead	1	Very good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, built-in 802.11b Wi-Fi, Secure Digital slot	Very good	Outstanding/ 6:38	Average/ 7.6	Good/ Fair	
1.6-GHz Pentium M	14.1	512	80	Touchpad, eraserhead	1	Good: 24X/10X/24X CD-RW drive, built-in Bluetooth	Outstanding	Outstanding/ 6:23	Light/ 6.2	Good/ Good	
1.5-GHz Pentium M	15	256	40	Touchpad	1	Very good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, FireWire port, Microsoft Works 2003	Very good	Very good/ 3:49	Average/ 7.4	Good/ Fair	
1.6-GHz Pentium M	14.1	512	40	Touchpad, eraserhead	1	Good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, built-in 802.11b Wi-Fi, SmartCard reader	Good	Good/ 3:26	Average/ 6.5	Fair/ Fair	
2.2-GHz Pentium 4-M	15	256	60	Touchpad, eraserhead	1	Very good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive	Outstanding	Good/ 3:22	Average/ 7.2	Good/ Good	
1.4-GHz Pentium M	15	512	40	Touchpad, eraserhead	1	Good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, FireWire port	Very good	Outstanding/ 6:05	Average/ 7.6	Good/ Fair	
2-GHz Pentium 4-M	14.1	256	40	Touchpad	1	Good: 8X DVD-ROM and 16X/10X/24X CD-RW combo drive	Very good	Fair/ 2:04	Average/ 6.6	Fair/ Poor	
	5 percent					10 percent		10 percent	5 percent	10 percent	25 percent

	BASE CONFIGURATION						Extra features ⁴	Overall design	Battery life (hours:min) ⁵	Average weight (pounds) ⁶	Vendor's reliability/ service
	CPU ²	Screen (inches)	RAM (MB)	Hard drive ³	Pointing device	Multi-purpose bays					
	1.52-GHz Mobile Athlon 4 XP 1800+ ⁷	15	512	40	Touchpad	0	Outstanding: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, Microsoft Office XP SBE 2002	Fair	Good/ 3:02	Heavy/ 8.0	Fair/ Poor
	1.3-GHz Pentium M	14.1	256	30	Touchpad	1	Good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, gigabit ethernet, WordPerfect Productivity Pack	Good	Very good/ 3:54	Average/ 6.4	Fair/ Fair
	2.4-GHz Pentium 4*	15	512	60	Touchpad	1	Outstanding: DVD-R/RW drive, Microsoft Works 2002	Very good	Good/ 3:07	Heavy/ 9.1	Good/ Fair
	2.8-GHz Pentium 4*	15	512	40	Touchpad	1	Very good: 8X DVD-ROM and 16X/10X/24X CD-RW combo drive, FireWire port, Microsoft Works 2003	Very good	Limited/ 1:56	Heavy/ 8.5	"/
	2.4-GHz Pentium 4-M	14.1	512	40	Touchpad	1	Good: 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, FireWire port	Fair	Fair/ 2:00	Average/ 7.7	"/
	2-GHz Pentium 4-M	15	512	60	Eraserhead	1	Good: 8X DVD-ROM and 8X/8X/24X CD-RW combo drive	Very good	Limited/ 1:53	Heavy/ 7.8	Good/ Fair
	2.67-GHz Pentium 4*	15	512	40	Touchpad	0	Very good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, built-in 802.11b Wi-Fi, WordPerfect Productivity Pack	Fair	Limited/ 1:48	Very heavy/ 9.5	Fair/ Fair
	2-GHz Pentium 4-M	14.1	256	30	Touchpad	0	Good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive	Fair	Fair/ 2:20	Average/ 7.3	"/
	5 percent						10 percent	10 percent	5 percent	10 percent	25 percent

* Word score reflects both listed and unlisted features. Unless otherwise noted, all notebooks have a built-in modem and network adapter.

² Unless otherwise noted, all notebooks come with a lithium ion battery.
⁴ Includes computer, AC adapter, power cord, floppy drive, and optical drive.
⁷ Non-SpeedStep CPU.

* Single-speed desktop CPU.
⁶ Insufficient data to give a rating.

A business version of the 500m, Dell's Latitude D600 comes equipped with a SmartCard reader for extra security. The third Dell to make the chart, the desktop-replacement Inspiron 5100, boasts snazzy blue accents, but it weighs 9.5 pounds.

Two new portables from Sharp reside at

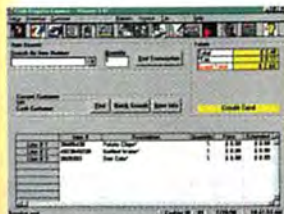
opposite ends of the notebook scale. (Neither made our chart.) The ultrathin, 2.1-pound Actius MM10 is a delight to carry, but it delivered underwhelming speed. The Actius RD10 just missed the power list—it's fast, but it weighs more than 10 pounds and has a short battery life. ■

TOSHIBA'S Tecra S1 demonstrated impressive speed.



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All PC America Software requires Microsoft Windows. The software was written in Visual Basic using Microsoft Access Files. The source code is available.

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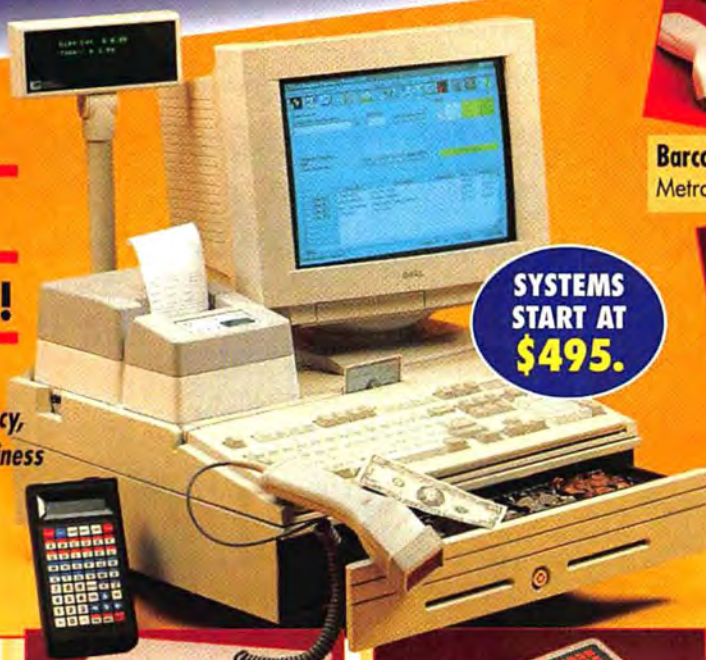


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TOP 10 PRINTERS

TOP 100

TEST
Center

Visit find.pcworld.com/35993 for reviews of all products tested this month and ranked in this chart.

THE OKI DATA OKI C7300n that topped our April chart retains the lead spot this month, though the speed king for both text and color photos is the new Xerox Phaser 7300/DN. Speed comes at a price, however—\$4199, to be exact. The much cheaper (albeit significantly slower) Minolta-QMS

Magicolor 2300 DeskLaser printed better-looking photos than the Xerox. The new Lexmark C912dn, this month's priciest model, has lots of paper-handling options. Our other newcomer, the \$1599 Panasonic KX-CL500, is the least-expensive printer this month to deliver Outstanding text quality.

	COLOR LASER PRINTER	Street price (5/23/03)	Overall rating	Speed for plain text/color photos (ppm)	Print quality for text/color photos	Comments
1	Best BUY Oki Data Oki C7300n find.pcworld.com/33929	\$2179	85	16.9/5.5	Outstanding/ Fair	FEATURES: Rated 24 ppm monochrome/20 ppm color. Standard 64MB of RAM, 1200-by-600-dpi maximum resolution, 630 sheets input, 500 output. SUMMARY: The C7300n did a stellar job when printing monochrome text or line art; and especially in color, it was very fast for the price. Color images, though detailed, had a dotted texture. (★★★★☆ Apr 03)
2	Best BUY Lexmark C750n find.pcworld.com/36227	\$2299	85	11.6/2.7	Very good/ Very good	FEATURES: Rated 20 ppm monochrome/20 ppm color. Standard 64MB of RAM, 2400-by-2400-dpi maximum resolution, 600 sheets input, 350 output. SUMMARY: The C750n produced sharp text and, for a color laser printer, attractive color photos. Print speed on color images was slow, however. (★★★★☆ Apr 03)
3	Minolta-QMS Magicolor 3100 DN find.pcworld.com/29202	\$1999	83	10.8/2.6	Outstanding/ Fair	FEATURES: Rated 16 ppm monochrome/16 ppm color. Standard 256MB of RAM, 1200-by-1200-dpi maximum resolution, 600 sheets input, 250 output. SUMMARY: Based on the same engine that the Brother HL-4000CN uses, this printer delivered comparable output. It includes a built-in duplexer. (★★★★☆ Apr 03)
4	Brother HL-4000CN find.pcworld.com/29201	\$2349	82	11.3/5.3	Outstanding/ Fair	FEATURES: Rated 16 ppm monochrome/16 ppm color. Standard 64MB of RAM, 1200-by-1200-dpi maximum resolution, 600 sheets input, 250 output. SUMMARY: The HL-4000CN printed clean text, and its color images—though slightly garish—showed good detail. The unit comes with a built-in duplexer. (★★★★☆ Apr 03)
5	Xerox Phaser 7300/DN find.pcworld.com/35912 NEW	\$4199	81	22.1/6.7	Outstanding/ Fair	FEATURES: Rated 37 ppm monochrome/30 ppm color. Standard 192MB of RAM, 600-by-2400-dpi maximum resolution, 630 sheets input, 250 output. SUMMARY: The fastest printer on the chart, this well-designed model printed very sharp text and line art, and it includes a built-in duplexer. Color photos, however, looked oversaturated and grainy. (★★★★☆)
6	Minolta-QMS Magicolor 2300 DeskLaser find.pcworld.com/33926	\$799	80	11.3/2.7	Very good/ Good	FEATURES: Rated 16 ppm monochrome/4 ppm color. Standard 32MB of RAM, 600-by-2400-dpi maximum resolution, 200 sheets input and output. SUMMARY: This surprisingly capable small-office printer has a great price. It produced sharp text, though not quite up to the standard set by pricier units. (★★★★☆ Apr 03)
7	Panasonic KX-CL500 find.pcworld.com/35909 NEW	\$1599	80	13.4/3.1	Outstanding/ Fair	FEATURES: Rated 21 ppm monochrome/16.9 ppm color. Standard 64MB of RAM, 1200-by-1200-dpi maximum resolution, 630 sheets input, 250 output. SUMMARY: The KX-CL500 printed excellent text; but diagonal lines in graphic art looked jagged, and color photos appeared blotchy and fuzzy. The control panel menus were easy to navigate. (★★★★☆)
8	Ricoh Aficio CL5000 find.pcworld.com/33947	\$2999	80	21.3/2.6	Outstanding/ Good	FEATURES: Rated 36 ppm monochrome/10 ppm color. Standard 64MB of RAM, 1800-by-600-dpi maximum resolution, 350 sheets input, 400 output. SUMMARY: The CL5000 printed razor-sharp text at a rapid clip, and it can handle 12-by-18-inch banner-size paper. It's slow at printing in color, however. (★★★★☆ Apr 03)
9	Lexmark C912dn find.pcworld.com/35915 NEW	\$5499	80	15.4/2.9	Outstanding/ Good	FEATURES: Rated 28 ppm monochrome/28 ppm color. Standard 256MB of RAM, 600-by-600-dpi maximum resolution, 1200 sheets input, 650 output. SUMMARY: Excellent paper-handling and a well-thought-out design are the highlights of this model, which includes a built-in duplexer. The C912dn generated crisp text and line art, as well as detailed photos. (★★★★☆)
10	HP Color LaserJet 5500n find.pcworld.com/33941	\$3599	80	12.5/5.0	Outstanding/ Good	FEATURES: Rated 21 ppm monochrome/21 ppm color. Standard 96MB of RAM, 600-by-600-dpi maximum resolution, 600 sheets input, 250 output. SUMMARY: The 5500n turned out great text and line art, but it produced dark, muddy gray-scale images. Though it printed color photos quickly, its other times were average. (★★★★☆ Apr 03)

FOOTNOTE: * All street prices include a network card. **HOW WE TEST:** We run time tests for text, line-art, and color and gray-scale photo samples, and then a panel of judges rates image quality. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See find.pcworld.com/10860 for details on PC World's Star Ratings. **CHART NOTES:** The overall rating for color laser printers is based on print quality (25 percent), price (25 percent), features (15 percent), ease of use (15 percent), speed (10 percent), and service and support (10 percent). For all ratings, higher is better.

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TOP 10 MONITORS

Visit find.pcworld.com/36221 for reviews of all products tested this month and ranked in this chart.

SINCE OUR ROUNDUP of 19-inch LCD monitors in February, the average price of chart makers has fallen by nearly \$140. This month, Dell's UltraSharp 1901FP takes top honors, helped by a four-port USB 2.0 hub and strong speakers. But the image-quality leaders are Sharp's LL-T19D1 and Eizo

Nanao's FlexScan L767 (both vendors are new to our 19-inch LCD chart). We also liked newcomer Cornea Systems' CT1904.

Editor's note: Last month, ViewSonic's G90f was omitted from our *Top 10 19-Inch CRT Monitors* list due to an editing error. It would have placed fourth on the chart.

	19-INCH LCD MONITOR	Street price (5/20/03)	Overall rating	Quality of text/graphics	Comments ¹
1	Best BUY Dell UltraSharp 1901FP find.pcworld.com/35777 NEW	\$769	86	Very good/ Very good	FEATURES: 16.4 by 8.2 by 17.2 inches, 16.5 pounds; dual video inputs; ² swivel, height, pivot adjustment; three-year warranty, 24-hour daily toll-free tech support. SUMMARY: Dell's cleverly designed LCD is fully—and very easily—adjustable. It provides fine image quality for all but the most demanding users. The panel includes a four-port USB 2.0 hub. Our test unit's optional speakers sounded exceptionally good. (★★★★☆)
2	Best BUY Samsung SyncMaster 191T find.pcworld.com/32363	\$750	85	Very good/ Very good	FEATURES: 16.4 by 8.2 by 17.7 inches, 13 pounds; dual video inputs; ² height, pivot adjustment; three-year warranty, 24-hour daily toll-free tech support. SUMMARY: The combination of a reasonable price, strong image quality, a wide measured viewing angle, ³ and easy-to-use controls earned this model a Best Buy. However, it lacks extras such as USB ports, audio ports, and speakers. (★★★★☆ Feb 03)
3	Sharp LL-T19D1 find.pcworld.com/35765 NEW	\$799	84	Outstanding/ Outstanding	FEATURES: 16.7 by 8.7 by 17.3 inches, 15.2 pounds; dual video inputs; ² height adjustment; three-year warranty, 24-hour daily toll-free tech support. SUMMARY: Sharp's first 19-inch LCD is a top performer for overall image quality. It includes two analog inputs (plus DVI) for extra sharing options. But the basic-looking unit (available in black or white) permits only limited and clumsy height adjustment. (★★★★☆)
4	ViewSonic VP191b find.pcworld.com/35780 NEW	\$780	84	Very good/ Very good	FEATURES: 16.4 by 9.4 by 13.9 inches, 16.5 pounds; dual video inputs; ² swivel, height, pivot adjustment; three-year warranty, 24-hour daily toll-free tech support. SUMMARY: Available in black or silver, the VP191b delivers solid image quality and an above-average viewing angle. ³ On-screen controls are very clear and easy to use. A second analog input provides more options for sharing between PCs. (★★★★☆)
5	Cornea Systems CT1904 find.pcworld.com/35774 NEW	\$650	82	Very good/ Outstanding	FEATURES: 16.6 by 7 by 17.4 inches, 13.5 pounds; dual video inputs; ² three-year warranty, 10-hour weekday toll-free tech support. SUMMARY: Stellar graphics quality and a very wide measured viewing angle ³ combine with a low price to produce a compelling package. On the downside, the panel has minimal adjustability, documentation is sparse, and tech support is a bit limited. (★★★★☆)
6	NEC-Mitsubishi AccuSync LCD9V find.pcworld.com/35783 NEW	\$670	81	Good/ Good	FEATURES: 16.5 by 9.1 by 16.4 inches, 16.1 pounds; analog video input; swivel, height adjustment; not TCO'99 or '95 compliant; three-year warranty, 24-hour daily toll-free tech support. SUMMARY: Available in black or white, this basic monitor has detailed documentation and is priced attractively, but it can't match the image quality of competing models that provide a digital input. (★★★☆☆)
7	Hitachi CML190B find.pcworld.com/32342	\$730	78	Outstanding/ Very good	FEATURES: 17 by 9.3 by 17.6 inches, 14.3 pounds; dual video inputs; ² swivel adjustment; TCO'95 compliant; five-year warranty (three on backlight), 9-hour weekday, toll-free tech support. SUMMARY: Hitachi's top-notch screen earned high scores, especially for text quality, and it has a long warranty period. But aside from a swivel base, few bells and whistles come with this monitor. (★★★★☆ Feb 03)
8	AOC LM914 find.pcworld.com/32333	\$670	78	Very good/ Good	FEATURES: 17 by 7.8 by 17.3 inches, 15.2 pounds; dual video inputs; ² three-year warranty, 12-hour weekday toll-free tech support. SUMMARY: This competitively priced model has respectable image quality and impressive built-in speakers with a convenient volume control knob. But its on-screen controls are a bit clumsy, and it lacks swivel and height adjustment capabilities. (★★★★☆ Feb 03)
9	Sceptre Technologies X9S-Naga find.pcworld.com/32366	\$640	78	Very good/ Good	FEATURES: 16.8 by 9.5 by 16.9 inches, 16.4 pounds; dual video inputs; ² swivel adjustment; one-year warranty, 9-hour weekday toll-free tech support. SUMMARY: This unit proves that the lowest price on the chart doesn't necessarily buy you the weakest performance—but it also doesn't buy you an industry-standard three-year warranty or long tech support hours. (★★★☆☆ Feb 03)
10	Eizo Nanao FlexScan L767 find.pcworld.com/35768 NEW	\$940	78	Outstanding/ Outstanding	FEATURES: 16.3 by 8.5 by 16 inches, 14.6 pounds; dual video inputs; ² height adjustment; three-year warranty, 8-hour weekday toll-free tech support. SUMMARY: Eizo's first digital 19-inch LCD (available in black or gray) has gorgeous image quality that you can refine with advanced adjustment software. Shortcomings include confusing controls, clumsy height adjustment, and limited tech support hours. (★★★★☆)

FOOTNOTES: ¹ For LCDs, viewable area is equal to screen size. ² Includes both digital (DVI) and analog inputs. DVI requires a graphics card with a digital output, which we use to test all monitors that offer DVI. ³ Go to find.pcworld.com/35954 for details. **HOW WE TEST:** Judges rate how well each monitor displays 13 text and graphics images at a native resolution of 1280 by 1024. Some screens are from DisplayMate for Windows (www.displaymate.com). See find.pcworld.com/34613 for testing details. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. **CHART NOTES:** Overall rating is based on text and graphics quality (20 percent each), price (25 percent), features and ease of use (20 percent), and support (15 percent). Monitors are TCO'99-compliant unless otherwise noted. Dimensions (given as width by depth by height) include the base. See find.pcworld.com/10860 for details on PC World's Star Ratings.

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TOP 10 HARD DRIVES

Visit find.pcworld.com/36278 for more details about all products tested this month and ranked in this chart.

HARD-DRIVE PRICES CONTINUE TO spiral downward: All 16 of the drives we tested this month cost less than \$2 per gigabyte, with the lowest-priced drive, Western Digital's Caviar WD1200BB, running a mere \$1.08 per gigabyte. Two Serial ATA drives—Maxtor's DiamondMax Plus 9 160GB

SATA and Seagate's 160GB Barracuda—make a splash, as well. What separates the drives on the chart, however, is less their relatively small differences in speed and more the quality of their bundled extras—namely, the software, the documentation, and the mounting kits included in the package.

	HARD DRIVE	Street price (5/29/03)	Overall rating	Capacity (GB)	Performance/support policies	Comments
1	Best Buy Maxtor DiamondMax Plus 9 6Y080LO NEW find.pcworld.com/36107	\$135	82	120	Very good/ Fair	FEATURES: 7200 rpm, ATA/133 interface, 8MB buffer, installation kit, one-year warranty, 12-hour weekday toll-free support. SUMMARY: This model costs a mere \$1.13 per gigabyte, among the lowest prices on the chart. The hard drive is bundled with a drive kit and excellent documentation. (★★★★☆)
2	Best Buy Maxtor DiamondMax Plus 9 6Y160MO NEW find.pcworld.com/36125	\$230	82	160	Outstanding/ Fair	FEATURES: 7200 rpm, Serial ATA interface, 8MB buffer, one-year warranty, 12-hour weekday toll-free support. SUMMARY: Of the models we tested this month, Maxtor's Serial ATA drive finished second in our speed tests. It comes with a complete drive kit and comprehensive documentation. (★★★★☆)
3	Hitachi Global Storage Technologies Deskstar 180GXP IC35L120AVV207-I NEW find.pcworld.com/36101	\$137	80	120	Outstanding/ Fair	FEATURES: 7200 rpm, ATA-6 interface, 8MB buffer, one-year warranty, 12-hour weekday toll-free support. SUMMARY: Originally sold under the IBM name, the fastest drive we tested this month offers an excellent software bundle but lacks a drive kit, so you'll have to provide your own drive rails, screws, and IDE cables. (★★★★☆)
4	Western Digital Caviar WD1200BB find.pcworld.com/36146	\$130	79	120	Very good/ Good	FEATURES: 7200 rpm, ATA/100 interface, 2MB buffer, installation kit, one-year warranty, 10-hour Monday through Thursday, 8-hour Friday, and 9-hour Saturday toll-free support. SUMMARY: This drive turns in the lowest cost per gigabyte. It has a smaller buffer than the number ten drive and is a bit slower. Retested this month. (★★★★☆)
5	Seagate Barracuda 7200.7 ST3160021A NEW find.pcworld.com/36140	\$175	79	160	Very good/ Limited	FEATURES: 7200 rpm, ATA/100 interface, 2MB buffer, installation kit, one-year warranty, 12-hour weekday toll-free support. SUMMARY: This Barracuda has a low cost per gigabyte, a complete mounting kit, and comprehensive documentation, but the company's support hours are the stingiest on the chart. (★★★★☆)
6	Samsung SpinPoint SP8004H NEW find.pcworld.com/36131	\$95	79	80	Good/ Outstanding	FEATURES: 7200 rpm, ATA/100 interface, 2MB buffer, installation kit, three-year warranty, 24-hour daily toll-free support. SUMMARY: The SpinPoint has the most generous combination of warranty and technical support hours of any hard drive on the chart; it was the slowest unit in our performance tests, however. (★★★★☆)
7	Hitachi Global Storage Technologies Deskstar 180GXP IC35L090AVV207-O NEW find.pcworld.com/36098	\$90	78	80	Very good/ Fair	FEATURES: 7200 rpm, ATA-6 interface, 2MB buffer, one-year warranty, 12-hour weekday toll-free support. SUMMARY: This bargain-priced Deskstar drive has impressive speed. It does not include a mounting kit, so you'll have to obtain an IDE cable, screws, and drive rails separately. Support hours are relatively limited. (★★★★☆)
8	Western Digital Special Edition WD1200JB find.pcworld.com/36152	\$150	78	120	Very good/ Good	FEATURES: 7200 rpm, ATA/100 interface, 8MB buffer, installation kit, three-year warranty, 10-hour Monday through Thursday, 8-hour Friday, and 9-hour Saturday toll-free support. SUMMARY: In the middle of the pack in speed and cost per gigabyte, this drive comes with few diagnostic tools. Retested this month. (★★★★☆)
9	Seagate Barracuda 7200.7 ST3160023AS NEW find.pcworld.com/36137	\$229	76	160	Outstanding/ Limited	FEATURES: 7200 rpm, Serial ATA interface, 8MB buffer, installation kit, one-year warranty, 12-hour weekday toll-free support. SUMMARY: Fourth overall in our speed tests, Seagate's Serial ATA drive includes a host of software for partitioning, diagnostics, and formatting. It costs \$54 more than its ATA sibling. (★★★★☆)
10	Western Digital Special Edition WD800JB find.pcworld.com/36143	\$115	75	80	Very good/ Good	FEATURES: 7200 rpm, ATA/100 interface, 8MB buffer, installation kit, three-year warranty, 10-hour Monday through Thursday, 8-hour Friday, and 9-hour Saturday toll-free support. SUMMARY: This model offers midrange performance, limited tools and diagnostics utilities, and a relatively high cost per gigabyte. Retested this month. (★★★★☆)

HOW WE TEST: To test performance, we copy a 1.3GB folder and a single large 1.3GB .zip file to the Windows Desktop, scan a 1.85GB folder with McAfee Virus Scan 7, search the files on the drive for a text string, time how long it takes to open a file in Adobe Premiere 6 and perform several tasks, create CD-ROM images with Ahead Nero Burning ROM 5.5.7.6, and time how long it takes to compress files with WinZip 8.1. All tests are carried out on a Dell Dimension 8200 configured with a 2-GHz Pentium 4 CPU, Windows XP, and a Promise SATA150 Plus (SATA and ATA/133) hard-drive interface. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. **CHART NOTES:** Each drive's overall rating is based on price (30 percent), performance (35 percent), features (20 percent), and technical support policies (15 percent). See find.pcworld.com/10860 for details on PC World's Star Ratings.



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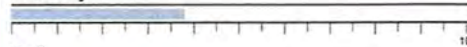


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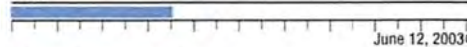
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TOP 10 DIGITAL CAMERAS

Visit find.pcworld.com/36263 for reviews of all products tested this month and ranked in this chart.

THREE NEW 3-megapixel cameras on the chart have common attributes: The Kodak EasyShare DX6340, the Nikon Coolpix 3100, and the Sony Cyber-shot DSC-P72 are compact, lightweight, and easy to use; all three also produce pleasing shots. The fourth newcomer, Olympus's C-740 Ultra Zoom,

has a 10X optical zoom lens and many advanced controls, making it a good choice for outdoor photography. It took the best shots of the four new models as well. Also tested: The Argus DC3810 offers 5-megapixel resolution for only \$400, but its below-average image quality kept it off our chart.

	CAMERA: UNDER \$500	Street price (5/30/03)	Overall rating	Image quality	Ease of use	Battery life/shots	Comments ¹
1	Best BUY Olympus C-4000 Zoom find.pcworld.com/30476	\$450	82	Outstanding	Good	Outstanding/700	FEATURES: 4-megapixel resolution, 16MB SmartMedia card, 32mm to 96mm focal range, USB and video output, 14 ounces. SUMMARY: Inexpensive for an advanced camera, the C-4000 blends great image quality, manual exposure settings, and a long battery life. Menus can be confusing. (★★★★☆ Nov 02)
2	Best BUY Nikon Coolpix 3100 NEW find.pcworld.com/36065	\$350	82	Good	Very good	Very good/480	FEATURES: 3.2-megapixel resolution, 16MB CompactFlash media, 38mm to 115mm focal range, USB and video output, 6.9 ounces. SUMMARY: One of the smallest Nikon units is also one of the easiest to operate; it has a huge selection of shooting aids for the casual photographer. (★★★★☆)
3	Kodak EasyShare DX6340 NEW find.pcworld.com/36089	\$330	82	Good	Very good	Outstanding/911	FEATURES: 3.1-megapixel resolution, 16MB internal memory and 16MB Secure Digital media, 36mm to 144mm focal range, USB and video output, 9.7 ounces. SUMMARY: The 4X optical zoom on this stylish model is longer than most. The camera can dock directly onto a small Kodak printer. (★★★★☆)
4	Olympus C-740 Ultra Zoom NEW find.pcworld.com/36059	\$499	81	Very good	Good	Outstanding/1219	FEATURES: 3.2-megapixel resolution, 16MB XD-Picture Card, 38mm to 380mm focal range, USB and video output, 14.3 ounces. SUMMARY: The C-740 cleverly packs a 10X optical zoom lens in a relatively compact camera. Its images were among the best we've seen from a sub-\$500 model. (★★★★☆)
5	Canon PowerShot S400 Digital Elph find.pcworld.com/35324	\$499	80	Very good	Very good	Fair/214	FEATURES: 4-megapixel resolution, 32MB CompactFlash media, 36mm to 108mm focal range, USB 2.0 and video output, 7.8 ounces. SUMMARY: The elegantly designed, ultracompact S400 takes great shots and sports a sturdy stainless-steel body, but it lacks manual controls and has relatively short battery life. (★★★★☆ July 03)
6	Nikon Coolpix 4300 find.pcworld.com/32000	\$450	80	Outstanding	Fair	Good/277	FEATURES: 4-megapixel resolution, 16MB CompactFlash media, 38mm to 114mm focal range, USB and video output, 10.1 ounces. SUMMARY: The moderately lightweight 4300 takes wonderful shots and is easy to hold with one hand, but its multilayered menus make using its advanced features difficult. (★★★★☆ Jan 03)
7	Fujifilm FinePix 3800 find.pcworld.com/32450	\$400	79	Good	Good	Outstanding/546	FEATURES: 3.24-megapixel resolution, 16MB XD-Picture Card, 38mm to 228mm focal range, USB and video output, 13.8 ounces. SUMMARY: The 3800 has a longer zoom and better battery life than most models on the chart; styled like a single-lens reflex camera, it's relatively bulky. (★★★★☆ Feb 03)
8	Konica Digital Revio KD-400Z find.pcworld.com/32435	\$350	79	Outstanding	Very good	Fair/177	FEATURES: 4-megapixel resolution, 16MB Memory Stick media and Secure Digital slot, 39mm to 117mm focal range, USB and video output, 7.3 ounces. SUMMARY: This tiny camera earned very high image-quality scores, but the documentation is weak and the battery life is only fair. (★★★★☆ Feb 03)
9	Sony Cyber-shot DSC-P72 NEW find.pcworld.com/36020	\$330	79	Good	Very good	Very good/462	FEATURES: 3.2-megapixel resolution, 16MB Memory Stick media, 39mm to 117mm focal range, USB 2.0 and video output, 9.1 ounces. SUMMARY: One of the few models we've seen with high-speed USB 2.0 for faster image transfers. Its compact size and easy-to-use controls make it a fine family camera. (★★★★☆)
10	HP Photosmart 935 find.pcworld.com/35327	\$449	79	Good	Good	Good/390	FEATURES: 5.1-megapixel resolution, 32MB Secure Digital media, 37mm to 111mm focal range, USB 2.0 and video output, 9.2 ounces. SUMMARY: The 935 is the first digital camera we've reviewed to offer a built-in help system, but it's noticeably slower to operate than most other units in this group. (★★★★☆ July 03)

FOOTNOTE: ¹Resolutions are expressed in effective pixels, focal range is identified as 35mm equivalent, and camera weights include batteries. **HOW WE TEST:** To gauge picture quality, we take a series of shots, with and without flash, at 640 by 480 resolution and at the camera's highest resolution. We photograph a complex still life and a mannequin to see how well each camera captures details and subtle colorings such as skin tones. A panel of judges reviews the on-screen and printed photos and assigns image-quality scores; we then average those scores. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. **CHART NOTES:** Overall ratings are based on price (25 percent), picture quality (20 percent), ease of use (15 percent), features (20 percent), battery life (10 percent), and support (10 percent). For all ratings, higher is better. See find.pcworld.com/10860 for details on PC World's Star Ratings.



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MORE REVIEWS

MISSED AN ISSUE OF *PC World* or passed your copy along to a friend? Here's a recap of other *Top 100* topics from previous issues. To read reviews of the products ranked on these Top 10 charts, go online and type in the *PC World* Find-It

URL at the top of each chart (for example, go to find.pcworld.com/35378 for the *Top 10 Ink Jet Printers* chart). Next month we'll look at photo printers, rewritable DVD drives, 15-inch LCD monitors, and digital cameras priced at \$500 and over.



SONY'S DRU-510A is the first rewritable DVD drive we've tested that takes advantage of 4X-rated media.

LEXMARK'S Z605 Color Jetprinter costs just \$50—less than many software apps, making it easily the least-expensive ink jet on the chart. Unfortunately, a full set of replacement ink cartridges costs more than the printer itself.



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HERE'S HOW

EDITED BY MICHAEL S. LASKY, DENNIS O'REILLY, AND ERIC DAHL



HARDWARE TIPS

KIRK STEERS

Take a Crash Course in Emergency PC Recovery

SOONER OR LATER, a faltering hard disk, CPU, or other component will bring your PC to its knees. If a dead machine means you can't do your job, the failure may bring you to your knees as well, begging your boss or an angry client for mercy.

Waiting for the IT department or the local repair shop to fix your system, or arranging to use a loaner machine, can cost you hours of valuable work time. What you really need when disaster strikes is a way to get up and running *fast*.

First, find out what caused the problem: Wisps of acrid smoke wafting from your

monitor's case, for example, send a very clear message. Unfortunately, the source of problems is rarely so obvious. Maybe a chip has failed, a Windows driver has been corrupted, or a cable has come loose. You can easily lose countless hours just trying to figure out what's wrong. Always remember the first rule of do-it-yourself PC repair: Know when to quit.

Or at least know when to ask—or pay—for expert help. Place a dollar value on an hour of your time and keep tabs on how much "money" you've invested as you go. It probably won't be too long before pay-

ing \$35 to your PC maker's tech support line will seem like money well spent.

Save time by being prepared. When an airplane starts to sputter, the pilot pulls out a checklist and performs tasks that are known to work. Here's a troubleshooting checklist for your PC.

Check the obvious first: Make sure that all your power switches are turned on, and that your cables and cords are securely connected. Don't forget to check the fuse or reset switch on your surge protector.

Look in Device Manager: Windows' Device Manager will tell you if a component isn't working properly. To open Device Manager in Windows 98, Me, and 2000, right-click *My Computer* and select *Properties* (or press <Windows>-<Break> if you have a Windows keyboard) to open System Properties, and choose the *Device Manager* tab. In Windows XP, open System Properties as described above, select the *Hardware* tab, and click the *Device Manager* button.

A red X or a yellow circle with an exclamation point appearing next to the name of a device indicates a problem (see **FIGURE 1**). Double-click the listing to display the device's Properties screen, and then look in the 'Device status' box for more information (see **FIGURE 2**).

Test your suspicions: If you think a sound card, network adapter, CD-RW drive, or other device is misbehaving, disable it and see if the problem goes away. Open the device's Properties dialog box as described above. Under the General tab, choose *Disable in this hardware profile* (in Windows 98, Me, and 2000), or *Do not use this device (disable)* on the 'Device usage' drop-down menu (in Windows XP).

Check the plumbing: Turn off and unplug your PC, open its case, and make sure every cable, cord, and connector is prop-

152 HARDWARE TIPS

Be prepared for your next system failure by creating a crash checklist; add a RAID controller for extra protection.

156 WINDOWS TIPS

Make Windows XP and Windows 2000 start up faster by disabling unneeded services; download a simple—and free—daily organizer.

158 STEP-BY-STEP

Firewalls aren't just for broadband anymore. Keep any network connection safe—always-on or not.

160 INTERNET TIPS

Get low-cost, high-privacy Internet access from AOL and MSN; lose the dial-up dialog box; outfox spammers.

162 ANSWER LINE

Undo the effects of a Windows update gone bad; give your folders the view you like; switch your e-mail client; format Word paragraphs faster.



160

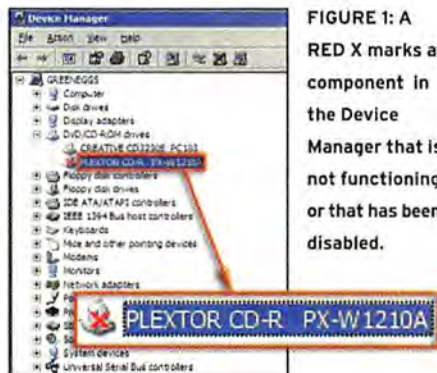


FIGURE 1: A RED X marks a component in the Device Manager that is not functioning or that has been disabled.

erly attached. Before you start handling your PC's internals, make sure that you're properly grounded. It's best to use a grounding wrist strap, which costs about \$10 at your local electronics store, but you can also discharge yourself momentarily by touching an antenna, water pipe, or other grounded object.

Sometimes detaching a connector and then reattaching it will take care of the problem. Likewise, expansion cards suffer from "creep"—they slowly work their way out of their motherboard slots. Carefully remove and replace them to ensure that they're properly reseated.



FIGURE 2: CHECK THE DEVICE'S Properties screen for error messages or conflict reports.

Try a different driver: Many hardware problems arise from conflicts relating to a device's software drivers. Check the Web site of your system or device manufacturer for updates. To find the version of your currently installed driver, open its Properties dialog box as described above and click the *Driver* tab (see **FIGURE 3**). Windows XP has a handy button on the tab that lets you reinstall an old driver when a newly installed one causes problems. (This happens more often than you might think, especially with graphics-card drivers.)

Perform some tests: Running a hardware-diagnostic program such as #1-PC Diagnostics' #1-TuffTest will perform a thorough check of your PC's hardware. Go to find.pcworld.com/35738 to download a limited free version. The more powerful shareware version of the utility is well worth the \$10 price, however.

RAID TO THE RESCUE

THE TYPICAL service life of today's hard drives means that they will outlast the usefulness of the computers in which they're installed. But hard drives have internal parts spinning at thousands of revolutions per minute separated by less than the width of a human hair. It does not happen often, but sometimes hard drives fail before their time.

Recovering from a hard drive's premature demise means buying and installing a new drive, reinstalling and reconfiguring all of your software, and reloading your data from backups. This can entail hours, if not days, of downtime. And if you didn't back up your data...well, we won't even go there.

But with just a little work, you'll never have to worry about a dead drive.

For years, mission-critical servers have been protected from the consequences of hard-drive failure by RAID, or Redundant Arrays of Independent Disks. RAID spreads data across several hard drives and makes all the drives appear as a single drive to the operating system. More-sophisticated RAID systems allow you to replace a failed drive without turning off the system; the data is re-created automatically with no interruption to you.

RAID technology comes in many fla-

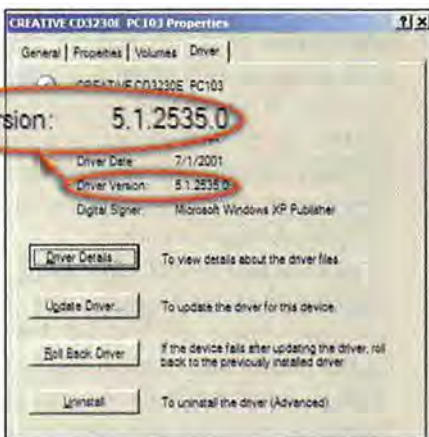


FIGURE 3: FIND YOUR DRIVER'S version on the Driver tab in its Properties dialog box.

vors called levels, numbered 0 to 7, plus 10, 30, 50, 53, and 0+1. Each level provides different combinations of redundancy and performance. RAID levels 3 and up are in the realm of IT network professionals; they require a minimum of three hard drives and expensive controller cards. But levels 0 and 1 are affordable and easy enough to be implemented for single PCs and small networks.

To add RAID to your computer, you need a second hard drive and a PCI RAID controller card such as Promise Technology's \$80 FastTrak100 TX2, which ►



PROMISE'S
FastTrak100
TX2 Pro RAID
system.

supports RAID levels 0 and 1, as well as the combination mode 0+1.

RAID level 0 distributes data across two drives via *striping*, which writes one bit of data to one drive, the next bit to the other drive, the third bit to the first drive, and so on. Because half as much data is being written to two drives simultaneously, disk performance is almost doubled. But RAID 0 offers no fault-tolerance: If either drive fails, all data on both drives is lost. RAID 1, on the other hand, provides hard-drive mirroring that instantly duplicates your primary drive—if either drive dies, you can continue working.

The FastTrak100 TX2 supports hot-swapping (the ability to replace a failed hard drive without having to shut down the PC); and for RAID 1 mirroring, it rebuilds the drive's data in the background. To make hot-swapping even easier, get at least one of Promise's SuperSwap drive housings. SuperSwap sits in a 5.25-inch

drive bay and lets you replace a hard drive without opening the PC's case.

Of course, you'll need two housings, one for each drive. At around \$70 each, that may seem like a bit of a luxury, but you can save a few dollars by buying the company's FastTrak100 TX2 Pro combination for around \$170; it's the FastTrak100 TX2 RAID card bundled with two SuperSwap housings. You can use a single SuperSwap housing for instant, off-site backups. Just purchase an additional hard drive and swap it with the one in the SuperSwap housing whenever you want a complete system backup to go.

Be sure to check your motherboard before you rush out and buy a RAID controller card. Some motherboards have built-in RAID controller chips. Check your motherboard manual or look in your PC's Setup program (your screen will tell you which key to press before Windows loads) for RAID options. If you're building a PC or having one built for you, paying a little extra for a motherboard that supports RAID is worthwhile.

GET A FRESH START

MINOR DEFECTS in a hard drive, an improper Windows shutdown due to a power failure, or poorly written software can damage critical system files. A RAID mirror drive instantly copies these corruptions from the original hard drive.

Tracking down these problems is largely a matter of luck. Restoring an earlier version of the Windows Registry and running diagnostic utilities are a good start, but they don't always work, and they can take hours to complete.

The fastest fix may be to replace your operating system, software, and data. The Drive Image 2002 backup software from PowerQuest makes this easy (see **FIGURE 4**). Drive Image allows you to copy an entire drive partition to a single compressed file that you can store on a CD-R or -RW disc, another removable medium, or a second hard drive. The backup file can restore the original partition in

HARDWARE TOOLBOX

Preventive Measures

WHEN TROUBLE strikes, be prepared. A few minutes of work now can save you hours of toil later on.

Take inventory: Copy the manufacturer and model number of your key components. You'll find much of this information in the System Information utility. Click *Start*•*Programs* (All Programs in Windows XP)•*Accessories*•*System Tools*•*System Information*. Cut and paste the data into a document and print it out.

Hold on to your software, manuals, and drivers: If you can't find a paper manual, look on the product manufacturer's Web site for downloadable manuals, even for older and discontinued models.

Load Windows' .cab files on your hard drive: Placing Windows' compressed .cab system files on the hard drive makes re-installing Windows files much easier. Copy the files with the .cab extension from the Windows disc to a directory on your hard drive. Whenever Windows asks for the CD, just point it to that directory.

Make a copy of your PC Setup program's settings: With a hard copy of your PC Setup program's BIOS settings, you won't have to reboot your system and enter Setup to know what they are. Enter the PC Setup program when your PC boots and take digital photographs of all the BIOS screens. Print the photographs or store them on your system, or both. Or simply copy them with pencil and paper.

less than an hour—often much quicker. Anything you added to the disk since you made the last image file will be lost, however, so keep your operating system and software in one partition and your data in another—each with an individual drive letter. I keep two backups of my software partition: one made when I first installed the OS and software, and another made after my most recent installation. ■

Go to find.pcworld.com/31511 for past Hardware Tips columns. Send your tips and questions to kirk_steers@pcworld.com. We pay \$50 for published items. Kirk Steers is a PC World contributing editor.

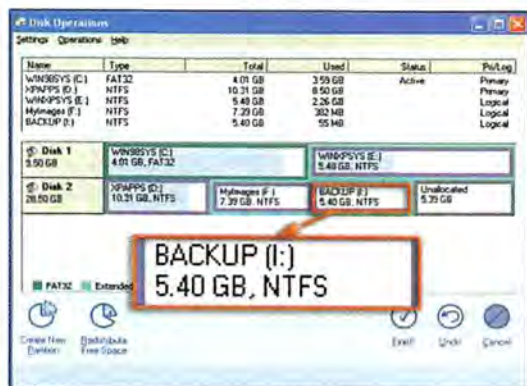
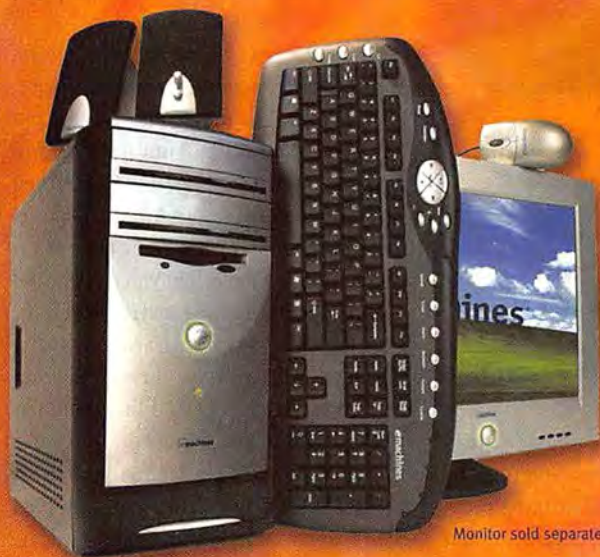


FIGURE 4: DRIVE IMAGE MAKES IT EASY to create backups of single partitions or entire hard drives.

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WINDOWS TIPS

SCOTT DUNN

INSIDE WINDOWS' SERVICES TOOL

DO YOUR MEMORY A DIS-SERVICE

SIMPLE AND FREE CALENDAR APP

Supercharge Windows by Paring Unneeded Services

Windows 2K XP 90 ME EVERY TIME you start Windows 2000 or XP, a virtual wheelbarrowful of components get loaded into your PC's memory. Many of these components, or "services," control Windows' use of hardware devices, memory, file management, and other vital system functions. But as tipster Morgan McClure of Groton, Massachusetts, points out, you just don't need some of these services. Consequently, letting them automatically load and run causes Windows to start a bit slower than necessary and ties up memory that could be put to better use. Fortunately, Windows' Services administrative tool allows you to control how and whether your system uses these services.

Two words of warning before we begin: First, before making any changes to your Windows configuration, back up your Registry, where the service settings are stored. Go to find.pcworld.com/35264 for instructions on how to back up and restore your Registry. Second, because some services directly affect many hardware and software components on your system, you should exercise great caution in turning them off or preventing them from starting automatically. If you aren't certain what a particular Windows service does or whether you need it, leave it on. And instead of turning off numerous services all at once, deactivate one of them, reboot your computer, and run your PC for hours or days

to make sure the change hasn't upset Windows' applet. When you're satisfied that everything is still working properly, you can go on to deactivate another unwanted service.

To open the Services applet, click **Start**, **Run**, type **services.msc**, and press **<Enter>**. You'll see a list of the services installed on your PC. The items listed vary from system to system and from one Windows version to another. To find out what each one does, look in the Description column. (If you can't see this column, choose **View • Detail**.) Alternatively, Windows

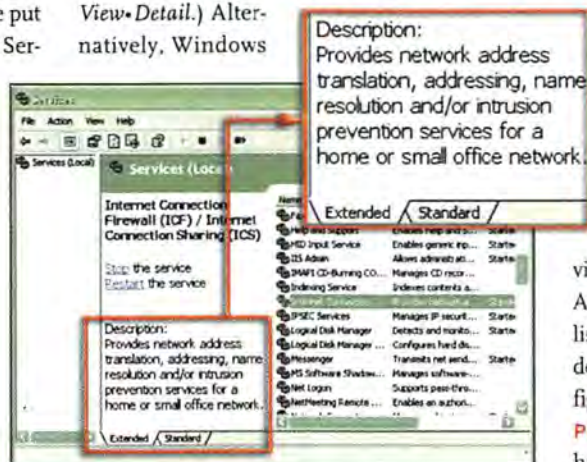


FIGURE 1: WINDOWS XP'S SERVICES applet tells you which services have started, how they start, and what they're for.

XP lets you see a selected item's description on the left side of the right pane on the default **Extended** tab (see **FIGURE 1**). The other tab basically replicates the view that Windows 2000 users see. To determine what other services and system components a service requires in order to

run, double-click the service's icon, its name, or another detail. Doing so will open the service's Properties dialog box; there, select the **Dependencies** tab.

To control how and whether Windows runs a service, open the service's Properties dialog box to the default **General** tab and select an option from the 'Startup type' drop-down list (see **FIGURE 2**). At one extreme, you can choose **Automatic**, forcing the service to start every time Windows starts. At the other, you can choose **Disabled** to prevent the service from ever starting. As a general rule, avoid choosing **Disabled** unless you're certain that you don't want the service and that no other, necessary services require it. The safer middle ground is the **Manual** option. A service with this startup type selected won't always start when Windows does, but it can be started by other dependent services when they need it. (As the name suggests, you can start a **Manual** service yourself by right-clicking it in the Services applet's right pane and choosing **Start**.)

So what services should you tinker with? That depends on your hardware and how you use it. Click the **Startup type** column heading to move all the services

that start automatically to the top of the list. Review these services to see if any of them don't have to start every day.

Determine which of the suggestions below apply to your situation. If you don't see one or more of these services on your system, don't panic.

As mentioned earlier, the services listed on any specific machine vary depending on your hardware configuration and version of Windows. **Put hardware on hold:** Check for hardware that you never use. Do you ever send or receive faxes on your computer (or expect to)? If not, set the Fax service to **Manual**

or **Disabled**. Never burn CDs on your machine? Then you don't need the IMAPI CD-Burning COM Service. If you do use it, you should be aware that many CD-burning utilities will work with this service set to **Manual**. (If yours doesn't, simply reset the service to **Automatic**.) Never

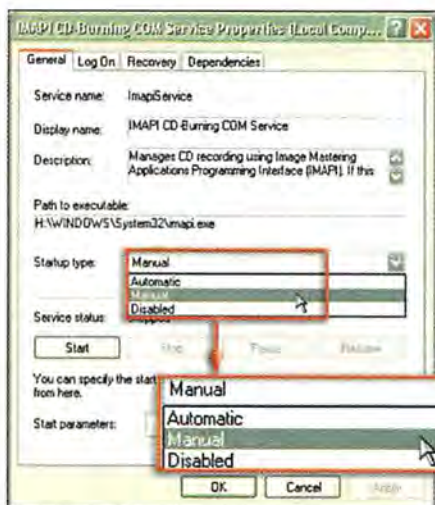


FIGURE 2: THE MANUAL OPTION prevents services from taking memory until needed.

use a smart card reader? Then you can probably live without the Smart Card service. Chances are you'll find in the list other active hardware-related services that your system doesn't require.

Thwack themes: If you don't use Windows XP's fancy new blue, olive green, or silver color schemes, and you aren't running a skinning utility that relies on Windows' themes, you can save a bundle of memory by turning off the Themes service. First, right-click your desktop and choose *Properties*. Click the *Appearance* tab. Make sure the 'Windows and buttons' option is set to *Windows Classic style*—and that you're happy with the look this setting gives you. Then click *OK* and open the Services applet. Double-click *Themes*. On the General tab, set 'Startup type' to *Manual* or *Disabled*. Click *OK*.

Stay alert—not: Few of us need the Windows services that let us send administrative alerts and notifications between computers. To deactivate these services, set the Messenger (not the same as Windows Messenger) and Alerter services to *Manual* or *Disabled*. Alerter relies on Messenger, so if you're going to disable the latter, you might as well zap the former.

Rev up dedicated-use computers: If you keep a computer around your home or office to serve a single function, you can reset a large number of services on it that don't relate to the machine's sole use. If, for example, you're running a Windows

2000 machine as a Web server, you can turn off more than a dozen irrelevant services. What's more, Microsoft will tell you how to do it, in detail: Go to find.pcworld.com/35267 to read all about it.

Eradicate error reporting: If you don't depend on XP's ability to tattle to Microsoft when you experience application crashes, you can disable this service. Visit find.pcworld.com/35270 to read about ways to customize XP's error reporting.

Flush out firewalls: If you use a third-party firewall—for example, Zone Labs' ZoneAlarm (visit find.pcworld.com/35273 to download the version that's free for noncommercial use)—you don't need the one built in to Windows XP. Click *Start*•*Control Panel*•*Network Connections* (in Category View, it's under *Network and Internet Connections*). Right-click the connection you use, and choose *Properties*. Click the *Advanced* tab and ensure that the Internet Connection Firewall option is unchecked. Finish by clicking *OK*. Notice that the steps for opening specific Control Panel icons vary from configuration to configuration.

Shut down sharing: If you don't use Windows' Internet Connection Sharing feature, open the Services applet and set XP's Internet Connection Firewall (ICF)/Internet Connection Sharing (ICS) service or 2000's Internet Connection Sharing service to *Manual* or *Disabled*.

Remove Remote Registry: When was the last time you needed to have someone manipulate your Windows Registry from afar? I thought so. Besides being unnecessary for most people, this feature might make security-minded users a bit nervous. So go ahead and disable Remote Registry (Remote Registry Service in Windows 2000), or at least set it to *Manual*.

Halt Help: If you seldom use XP's Help system, you can safely set the Help and Support service to *Disabled*. If you later choose *Start*•*Help and Support*, Windows will start the service anyway and reset its Services entry to *Automatic*.

The Help system is good for finding more-detailed information on individual Windows services. In Windows 2000, choose *Start*•*Help*, click the *Contents* tab, and choose *Glossary* in the left pane (you

WINDOWS TOOLBOX

Get Fuss-Free (and Cost-Free) Reminders With Myalert

MAYBE YOU DON'T need a big, complicated calendar and scheduling tool like Microsoft Outlook to manage the details of your life. You might be served better by a basic program that provides daily reminders of upcoming appointments, birthdays, and meetings. You'd be hard-pressed to find a simpler daily organizer than Myalert. The program lets you set up reminders that appear once, monthly, or annually, and you can arrange for these to notify you from one to seven days in advance. Notifications occur only when you log in to Windows, so the application won't help if you stay logged in all day, every day. But after you receive your reminder, Myalert goes away, taking up no memory. And since the software is free, you have nothing to lose by trying it out. Go to find.pcworld.com/35279 to give Myalert a spin.



may have to choose it twice). In Windows XP, click *Start*•*Help and Support*, enter *glossary* in the Search box, press *<Enter>*, and click the appropriate link in the left pane. The Windows glossary contains helpful descriptions of the various services and identifies the other services that each requires. Naturally, you can use Help's Search feature to find individual services, too. You'll also find detailed information on Windows' services online at Black Viper (www.blackviper.com). ■

Send Windows-related questions and tips to scott_dunn@pcworld.com. We pay \$50 for published items. Visit find.pcworld.com/31607 for more Windows Tips. Scott Dunn is a contributing editor for PC World.

STEP BY STEP

STAN MIASTKOWSKI

Bulletproof Your PC With a Software Firewall

A FIREWALL IS an absolutely necessary tool in every computer user's defensive arsenal, along with an antivirus utility. Firewalls are programs (sometimes hardware devices) that are designed to protect you and your system from the legions of hackers, crackers, and other evildoers who probe the Internet for unprotected PCs. Once they're in, such invaders can obtain private information or take over the computer for nefarious uses.

The problem is particularly acute if you have a full-time cable or DSL connection: Both types of connection use a limited and well-known range of Internet addresses that can be continually poked and prodded. (During a recent 24-hour period, we logged 463 intrusion attempts on a PC connected to a cable modem.) But dial-up Web users aren't immune, either.

Windows XP has a basic built-in software firewall (see Step 1), but for more-

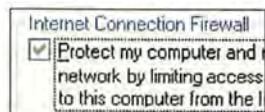
robust protection, you should opt for a commercial package. Companies like Sygate and Zone Labs offer both free and paid versions (the latter have extra features). Other vendors, such as McAfee and Symantec, offer only paid versions. Go to find.pcworld.com/35741 to download free, shareware, and trial editions of firewalls, and see *Internet Tips* on page 160 to read about one particular package.

Although firewalls differ, they share key features. We've come up with a list of the common steps and settings necessary to put your PC on high alert. The examples here are from Symantec's Norton Personal Firewall and Zone Labs' ZoneAlarm Pro. The exact steps for other packages will vary, so read your software's manual and online help carefully. ■

Stan Miastkowski is a PC World contributing editor. Contact him at stan_miastkowski@pcworld.com. Visit find.pcworld.com/31676 for past Step-By-Step columns.

1 Set the built-in firewall (Windows XP users only). Both XP Home and XP Professional include a bare-bones implementation called Internet Connection Firewall. We recommend using a third-party package instead—which means you should turn off XP's ICF.

Select *Start*, right-click *My Network Places*, and choose *Properties*. Right-click the connection you want to protect (LAN or High-Speed Internet for a broadband connection; Dial-Up for a standard modem connection), and choose *Properties*. Click the *Advanced* tab, uncheck the Internet Connection Firewall check box,



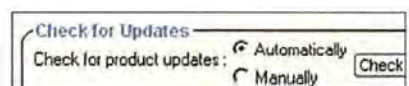
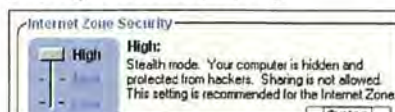
and click *OK* to turn off the built-in firewall.

2 Install and activate your firewall. Follow the vendor's directions. Confirm that the firewall is activated and starts automatically when you turn on your PC. Most

☒ Turn on Personal Firewall.

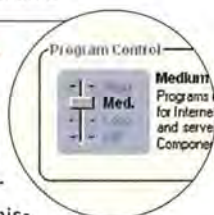
place a status indicator or an icon in your system tray at the bottom-right corner of your screen.

4 Set the security level. Firewalls have multiple levels of protection; we suggest you use the highest for peace of mind, though that may mean some tinkering to get file-sharing applications or online multiplayer games to run properly.

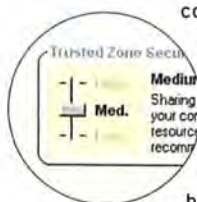


3 Turn on automatic updating. New varieties of Internet attacks appear regularly; it's crucial that you set your firewall to check for updates automatically so that you'll be immediately protected.

5 Enable Program Control. Your firewall needs to know which programs are allowed to access the Internet. Although you can set permissions manually, using the "automatic" or "learning" modes is easier. As unrecognized programs access the Net for the first time, you'll be asked if you trust them.



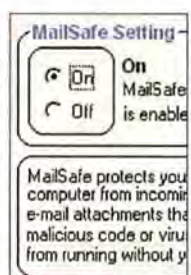
6 Establish a Trusted Zone. You'll want maximum security for your Internet connection, but perhaps greater freedom on your local network. To allow this, set up a Trusted Zone with a lower security level for PCs on your home or office network.



7 Choose the alerting level. All firewalls will alert you when intrusion attempts and even routine port scans occur, but you may not want to see alerts for innocuous events. Choose how severe the intrusion attempt should be before you are informed.



8 Set up special features. Most firewalls offer extra functions such as e-mail virus protection, cookie control, or ad blocking. If you want to use them, make sure they're enabled.



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INTERNET TIPS

SCOTT SPANBAUER

**SEND ALL THAT
SPAM 'THATAWAY'**

**STOP ANNOYING
PROMPT WINDOWS**

**DOWNLOAD A NEW
FREE FIREWALL**

Pay Less, Stay Private, and Block Spam in One Shot

IF YOU'RE ONE of the gazillion people who connect to the Internet using America Online or MSN, my sympathies are with you: Getting these ISPs' software to do what you want—and not what you don't want—isn't always easy, or possible. Still, the mega-ISPs can be worthwhile, especially for families, as long as you know how to wrangle their sometimes-arbitrary or hard-to-locate settings. So without further ado, here are three key tips for making life with AOL 8 Plus and MSN 8 a little more bearable.

SURF FOR LE\$\$, MAYBE

AOL'S STANDARD monthly rate for unlimited dial-up access is \$24. Is this a deal? You can pay less—only \$20 a month—by paying for an entire year in advance (or \$240). Already have access to the Internet? AOL's bring-your-own-access

plan shaves a few bucks off, down to \$15 a month. But if you currently have access, you probably don't need to pay even that. Go for the \$5 light-usage plan that includes 3 hours per month of connection time (additional hours are \$2.50 each), which is perfect if you just check e-mail from your connection or from airport kiosks, public libraries, and hotels. A similar \$10-per-month plan includes 5 hours of connect time, with additional hours costing \$3 each. To switch your billing plan, go to AOL keyword: **billing**.

MSN's standard account, which includes unlimited dial-up access as well as Encarta, Picture-It Express, and MSN Money Plus, is priced at \$22 a month. But if you already have a connection to the Internet (through your office, school, or broadband link), you can get the same services for only \$10 per month—or even

better, \$80 when you pay for a year's service in advance. Broadband accounts come with 10 hours of dial-up service too, so you'll be able to dial in from the road. If you use your online account only to check your e-mail, though, you might skate by with MSN's hourly plan, which gives you 20 hours of Internet access per month for \$10, with additional hours costing \$1.50 each.

The easiest way to switch to a different plan is to call MSN's Internet Access Customer Care at 800/386-5550.

PROTECT YOUR PRIVACY

ACCORDING TO AOL's noble-sounding Eight Principles of Privacy (keyword: **privacy policy**), the company may use information about your online purchases to steer marketing pitches your way, unless you tell it not to. To opt out, go to keyword: **marketing preferences** and click each of the buttons next to the five categories of marketing offers (mail from AOL, mail from other companies, telephone, e-mail, and pop-ups) in turn. Select the option at the bottom of each window that starts with *No, I do not want to receive*, and click OK (see **FIGURE 1**).

The MSN Explorer browser's settings are similar to those in Internet Explorer, giving you near-complete control over both cookies and downloaded programs (choose **Help & Settings**•**Settings**, then click **Privacy & Security** in the left column). But you won't find an obvious way to opt out of the Microsoft marketing program that drives ads and e-mail to you based on your personal information and browsing habits. To do that, visit privacy.msn.com to see Microsoft's plans for your personal information. Then to opt out, scroll down to the section titled 'Control your Personal Information', and click **MSN Communications Preferences**. After logging in with your .Net Passport user name and pass-

CUT DOWN ON SPAM BY DUMPING YOUR ADDRESS

YOU CAN REDUCE the amount of spam you receive by keeping your real e-mail address off public Web sites and newsgroup postings. No matter how careful you are, however, they'll get you anyway if your address contains common names or words. In addition to harvesting addresses from public sites, spammers also generate lists of likely e-mail addresses by combining common words and names with known domain names. If you're willing to undergo the temporary inconvenience of changing your e-mail address, you can reduce junk mail by switching to a longer name that spammers are unlikely to guess in advance, such as 2scottwithluv@isp.com.

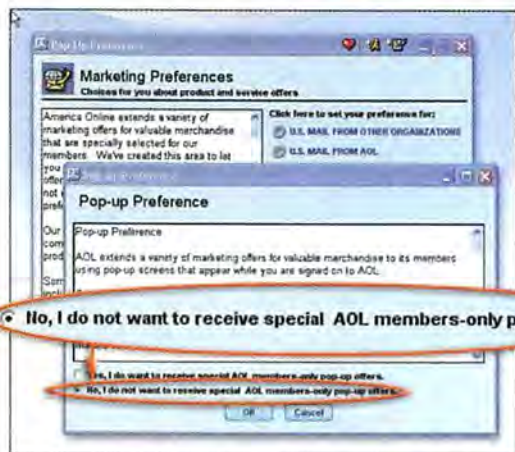


FIGURE 1: PREVENT MARKETING pitches AOL sends via mail, e-mail, phone, and pop-ups by opting out.

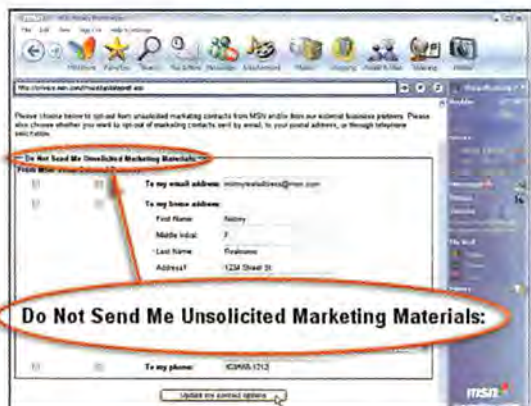


FIGURE 2: BLOCK MSN MARKETING mail, e-mail, and phone calls by updating your opt-out options online.

word, you'll see a screen where you can opt out of receiving promotional material from MSN and third-party marketers by e-mail, postal mail, and telephone (see **FIGURE 2**). To hide your name, e-mail address, date of birth, and other personal information from other Web sites you log into using .Net Passport, return to privacy.msn.com, click *MSN Personal Information Center*, and then click the *manage your information* link in the next page. Click *Edit my information* to the right of 'My Microsoft Passport Settings'. Uncheck all of the sharing options at the bottom of the page and click *Update*.

KILL THE CONNECTION DIALOG BOX

I HAVE CABLE access to the Internet, but on those occasions when it becomes unavailable, I use a dial-up ISP as an alternate. My problem is that when I check for e-mail using Outlook Express over the cable connection, I also get a pop-up window giving me an option to connect using dial-up. This is somewhat annoying. Is there a way to leave the dial-up option dormant until I really need it? I'm using Windows XP.

Sergio Calderon, Miami

THIS HAPPENS to me, too. Even when my cable modem connection is present and accounted for, slow Web sites can sometimes trigger the Dial-Up Connection dialog box that you describe. To banish it, open Control Panel, click *Network and Internet Connections* (if you're using Windows XP's Category view), open *Internet Options*, click the *Connections* tab,

select *Never dial a connection*, and click *OK*. When you're away from your cable modem, return to the same dialog box and instead choose *Always dial my default connection*.

FRY THAT SPAM

THOUGH AOL'S version 8 now offers you direct control over spam filtering, that doesn't mean AOL is stopping there. The company claims that its server-based spam filters delete billions of spam missives—more than two billion in one recent 24-hour period. Of course, plenty of junk mail will still sneak through. In AOL 8, when you find a spam message in your Mailbox, select it and click the *Report Spam* button at the bottom of the window. AOL will add the message to its database of known spam.

AOL 8 Plus introduces an optional mail program called AOL Communicator that—no surprise—looks a lot like the Mail module in the company's Netscape browser. One neat feature is a trainable spam filter that gives you local control over what gets junked and what doesn't. To enable the spam filtering in AOL Communicator, choose *Spam > Spam Filter*, select the *General* tab, click *Filter spam for all accounts*, and then click *OK*. When spam sneaks through the filter, select the of-



fending message in your in-box and click the toolbar's *Spam* button, shown here.

MSN offers some fairly good spam filters, but they're not enabled by default. To block unwanted messages, choose *Help & Settings > Settings*, click *E-Mail* in the left column, and then select *Junk Mail* on the right to view the Junk Mail Settings page. Click *Junk Mail Filter*, check *Turn on MSN Junk Mail Protection*, and click *Save Changes*. If you discover that MSN's spam filter isn't catching enough of the incoming junk, you can boost its powers. Click

DOWNLOAD OF THE MONTH

Kerio Personal Firewall 2

ZONEALARM is the best-known free personal firewall, but it's not the only one around. Kerio Technologies' Kerio Personal Firewall is small (a 2MB download), easy to set up, and free to nonbusiness users (business users pay \$39). Like other high-quality firewalls, Kerio pops up dialog boxes asking whether you'd like to allow applications to send and receive data over your network connection, and it can store your answer as a filtering rule for future reference. Kerio comes with a number of predetermined rules for network connections that are known to be safe (or unsafe), and it allows you to set up your own rules manually. The program also shows the applications currently connected and active—a great way to spot Trojan horses and backdoor pro-

Kerio Personal Firewall - Opened Connections at localhost						
Application	Protocol	Local Address	Remote Address	State	Creation Time	
ALG EXE	TCP	localhost:3001	---	Listening	06/Apr/2003 16:57:22	
GNULIBUS EXE	UDP	at:5467	---	Listening	06/Apr/2003 19:53:12	
GNULIBUS EXE	TCP	at:22070	---	Listening	06/Apr/2003 19:53:12	
GNULIBUS EXE	TCP	at:3071	---	Listening	06/Apr/2003 19:53:12	
LSASS EXE	UDP	at:lsassp	---	Listening	06/Apr/2003 16:57:17	
MSMSGSGS EXE	UDP	192.168.2.9:3508	---	Listening	06/Apr/2003 20:12:59	
MSMSGSGS EXE	UDP	192.168.2.9:8270	---	Listening	06/Apr/2003 20:13:00	
MSMSGSGS EXE	TCP	192.168.2.9:12500	---	Listening	06/Apr/2003 20:13:00	
MSMSGSGS EXE	UDP	at:3011	---	Listening	06/Apr/2003 17:13:02	
OUTLOOK EXE	TCP	at:3529	mail.anti.com:imp	Connected Out	06/Apr/2003 20:26:30	
SVCHOST EXE	UDP	localhost:2234	---	Listening	06/Apr/2003 16:57:22	
SVCHOST EXE	TCP	localhost:3002	---	Listening	06/Apr/2003 16:57:22	
SVCHOST EXE	TCP	localhost:3003	---	Listening	06/Apr/2003 16:57:22	
SVCHOST EXE	TCP	at:5000	---	Listening	06/Apr/2003 16:57:23	
SVCHOST EXE	UDP	192.168.2.9:1900	---	Listening	06/Apr/2003 20:13:01	
SVCHOST EXE	TCP	at:1025	---	Listening	06/Apr/2003 16:56:58	
SVCHOST EXE	UDP	localhost:ntp	---	Listening	06/Apr/2003 20:13:01	
SVCHOST EXE	UDP	at:3005	---	Listening	06/Apr/2003 16:57:24	

grams to which you may have inadvertently granted network access. Go to find.pcworld.com/35141 to download your copy of Kerio Personal Firewall.

Advanced Junk Mail Filter In the Junk Mail Settings page, select *Enhanced (most junk mail is caught)*, and then click *Save Changes*. Be sure to check frequently in the Junk Mail folder under Folders on MSN's Mail screen to catch any legitimate messages that MSN mistakenly sends to the Junk Mail folder.

Send your questions and tips to nettips@spanbauer.com. We pay \$50 for published items. Go to find.pcworld.com/31523 for more Internet Tips. Scott Spanbauer is a contributing editor for PC World.

ANSWER LINE

LINCOLN SPECTOR

When a Windows Update Makes Things Worse



A RECENT Windows Update has destabilized my system. Is there a way to undo these patches?

Bob Catanzano,

North Andover, Massachusetts

MICROSOFT PROVIDES ways to undo disastrous updates, but they don't work with every patch. Let's hope that one of the solutions below will work for you.

lation history in the left panel to see a list of the updates you've downloaded and installed. Many of the entries include a 'Read more' link. Click that and scroll to the bottom of the resulting browser window for uninstall instructions. Unfortunately, they may just tell you to use Windows' Add/Remove Programs (see **FIGURE 1**) or that 'Uninstall is not available.'

If your PC's problems started after you updated a hardware driver in Windows XP, right-click **My Computer**•**Properties**•**Hardware**•**Device Manager**. In Device Manager, expand the appropriate device category. Right-click the device that has the bad update and select **Properties**. In the next dialog box, click the **Driver** tab, and then the **Roll Back Driver** button. Follow the prompts from there.

Finally, try restoring your system's Registry to an earlier incarnation. Rolling back your

Registry could make things worse, so back up the Registry beforehand; go to find.pcworld.com/35723 for instructions.

GET THE LOOK YOU LIKE



I PREFER Windows Explorer's Details view. But in some folders, such as Control Panel, I want to see files represented as icons. How do I set the display view for a particular folder?

Joseph Allison, Owasso, Oklahoma

BEGIN BY GIVING a folder the look you want the majority of your folders to have, and then select **Tools**•**Folder Options**•**View**•**Like Current Folder (Apply to All Folders in Windows XP)**. Click **Yes** when prompted.

Scroll down to the option 'Remember each folder's view settings', make sure it's checked, and click **OK**. Now your folders will open with the view you've chosen. If you alter the view of a folder later, you'll see the changed view when you reopen it.

CHANGE YOUR MAIL PROGRAM



WHEN I SELECT **File**•**Send To**•**Mail Recipient** in Word or Excel, the document opens in Outlook Express. How do I make it link to Outlook?

Todd Praneis, Rockton, Illinois

YOUR DEFAULT E-MAIL client is determined by a Windows setting that also affects the program that opens when you click a 'mailto' link in a Web browser, among other e-mail-related options. To change this setting, open Internet Explorer, select **Tools**•**Internet Options**•**Programs**, choose your preferred program from the 'E-mail' pull-down menu, and click **OK**.

The menu options may seem Microsoft-centric: Your computer likely arrived with options for Hotmail, Microsoft Outlook, Outlook Express, and MSN Explorer. America Online, Eudora, Lotus Notes, Netscape Mail, and other installed third-party e-mail programs may or may not appear on this menu too.

Send your questions to answer@pcworld.com. Answer Line pays \$50 for published items. See find.pcworld.com/31577 for more Answer Line columns. You'll find Contributing Editor Lincoln Spector's humorous writing at www.thelinkinspector.com.

FORMAT WORD PARAGRAPHS

IF YOU USE the **<Tab>** key to indent your paragraphs in Microsoft Word or press **<Enter>** twice to put a blank line between paragraphs, there's a better way, especially if you'll be editing and reformatting the document. Before you start writing, select **Format**•**Paragraph** and click the **Indents and Spacing** tab. To indent the first line automatically, select **First line** in the **Special** field. To add a blank line between paragraphs, enter **12 pt** in the **After** field. Click **OK**. If you make these changes to your **normal.dot** file, they will affect all new documents.

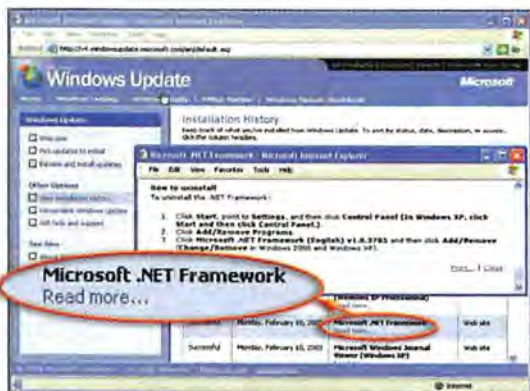


FIGURE 1: FIND OUT HOW to uninstall a Windows Update via Installation History's 'Read more' option.

Start with Control Panel's Add/Remove Programs applet ('Add or Remove Programs' in Windows XP). Select **Start**•**Settings**•**Control Panel** (**Start**•**Control Panel** in Windows XP). Double-click **Add or Remove Programs**. Updates will be listed on the **Install/Uninstall** tab (Windows 98 and Me) or under 'Change or Remove Programs' (Windows 2000 and XP). And yes, uninstalling major upgrades such as Internet Explorer 6 and Windows Media Player 9 with this applet will reinstall earlier versions of the programs.

Next, try Windows Update itself. Select **Start**•**Windows Update** or **Start**•**All Programs**•**Windows Update**. Click **View instal-**



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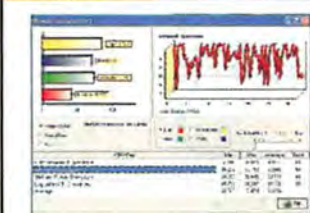
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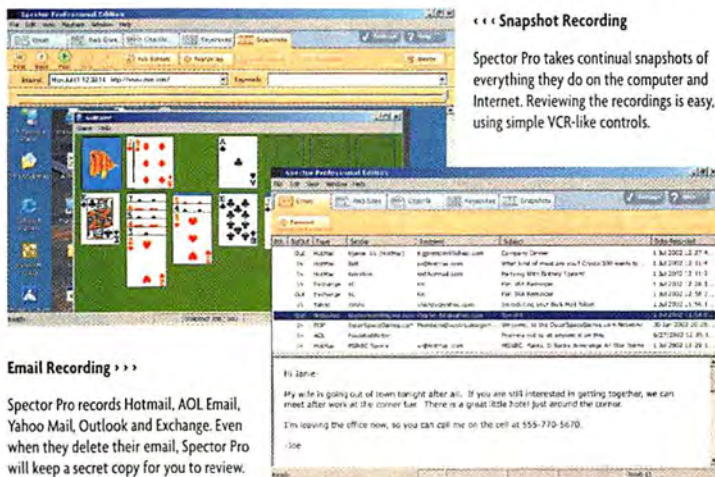
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Windows Longhorn: Prime Grade or Bull?

WE'RE ON THE ROAD AGAIN, this time to Longhorn, the next iteration of Windows. For the moment, despite a world of open-source competition, Microsoft is keeping specs close to the vest, hidden from everyone but its hardware and software partners. Most of what we officially know so far is

that it's supposed to have a long-promised advanced file system, plus fancier graphics and better security—and that it won't be available before the year after next.

Since that schedule gives the company plenty of time to listen to its customers, get out your wish list. Here are a few things this long-suffering user would like to see Microsoft do this time around.

Buy better design: When Microsoft comes up with a user interface idea, it's usually a bad one. Overall, the Windows XP look and feel amounts to dopey giant icons plastered over the rotting structure of the past; the details are even worse, such as the Search function's resurrection of a moribund cartoon doggie from Office. Conclusion: Bring in outsiders, not Redmondians, and start over from scratch.

Repair the plumbing: Installed a printer lately? Then you know "Plug and Play" should be renamed "Whatever You Do, Don't Plug This Product In Before You Install Its Software From the CD, or You'll Be Sorry!" If anything, Plug and Play has gotten worse over the years—the version in XP botches monitor refresh rates. P and P's pipes need extensive repairs that are still compatible with the peripherals we've paid for. And oh,

speaking of plumbing: How about delivering the crash-proof product that XP was supposed to be and clearly isn't?

Hire scribes: With each new release the geeks who churn out the help files add more volume but set new records for obfuscation. Now is the time to employ people who can clarify confusing products for hoi polloi. Even great design can't make this complex OS self-explanatory.

Plug the leaks: So far, Microsoft's Trustworthy Computing initiative has amounted to lip service and an endless parade of patch downloads. Exactly why should users be forced to buy separate programs

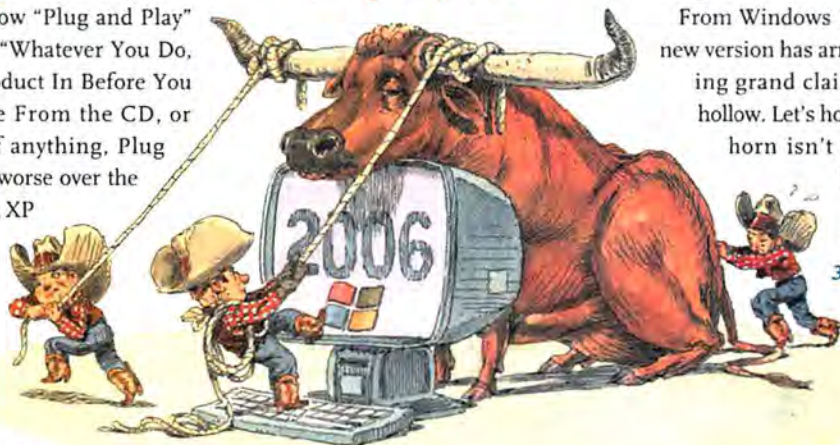
to prevent hacker attacks because security and integrity weren't built into the OS in the first place? As Bullwinkle used to say: "This time for sure."

Fix the fixers: We assume Microsoft won't get things right the first time. Or the fifth. But why can't the company at least get Windows Update to work? In my world, this service produces bizarre failures and delayed notifications, and it's rarely forthcoming about what's going on during the installation process.

Quit annoying: Windows 2000 omitted the very handy Msconfig program that first appeared in Windows 98. XP put the utility back, but if you use it to eliminate unwanted start-up programs, you have to dismiss two dialog boxes every time your machine boots up. The only other option is to click a little button that kills the dialog boxes—but also puts back all the programs you've eliminated. Windows' multiple irritations have provided endless fodder for the "Annoyances" Web site (www.annoyances.org) and book series; Longhorn needs to break the tradition.

From Windows 1.0 through XP, every new version has arrived with accompanying grand claims that soon proved hollow. Let's hope and pray that Longhorn isn't just another load of Microsoft bull. ■

How to make the next Windows upgrade a really big deal.



Visit find.pcworld.com/31595 to access additional columns by Contributing Editor Stephen Manes. He has written about technology for two decades.



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